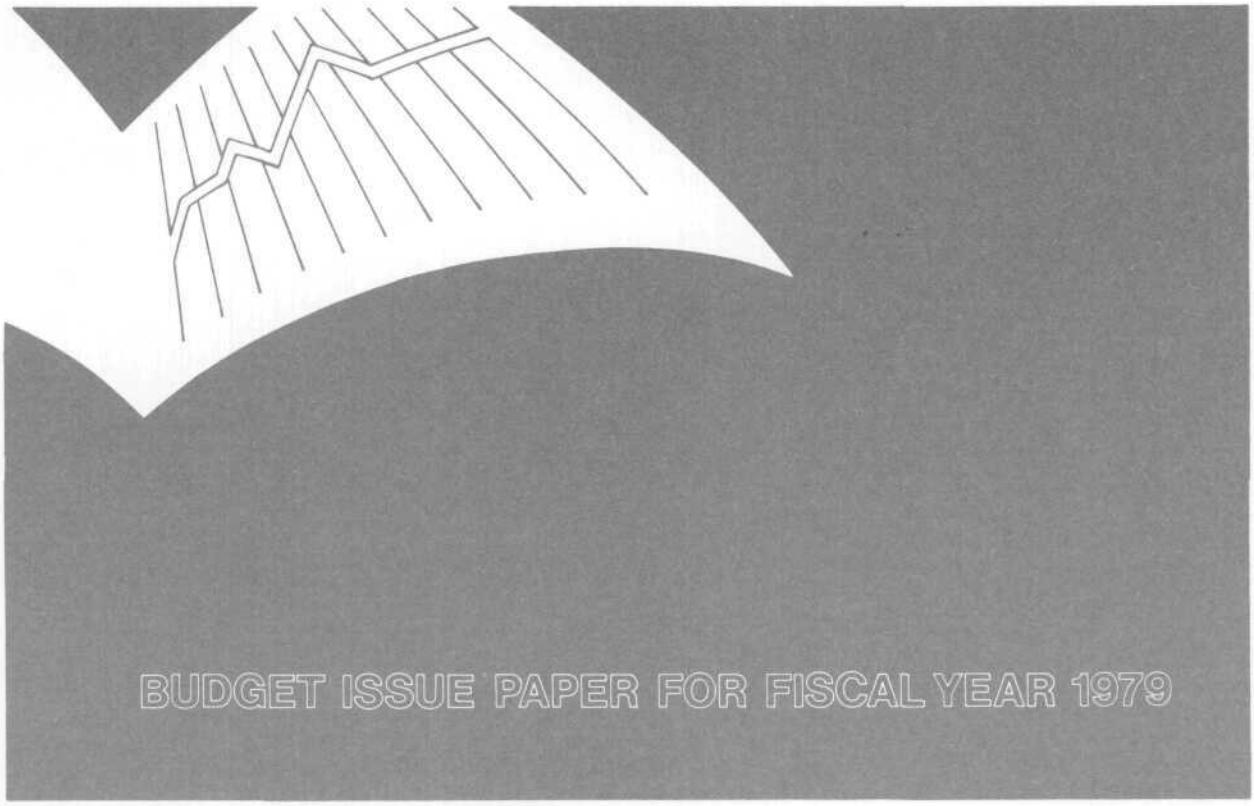
Assessing the NATO/Warsaw Pact Military Balance

December 1977 (Reprinted July 1978)



CONGRESSIONAL BUDGET OFFICE
CONGRESS OF THE UNITED STATES

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
JUL 1978		**00-00-1978 to 00-00-1978**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Assessing the NATO/Warsaw Pact Military Balance	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Congressional Budget Office ,Ford House Office Building, 4th Floor ,Second and D Streets, SW ,Washington,DC,20515-6925**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**81**	

ASSESSING THE NATO/WARSAW PACT MILITARY BALANCE

The Congress of the United States
Congressional Budget Office

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

PREFACE

How the United States plans to fulfill its defense commitments to the North Atlantic Treaty Organization (NATO) is the major determinant of the defense budget. This concern will provide much of the backdrop as the Congress decides on budgetary targets for the First Concurrent Resolution on the Budget for Fiscal Year 1979. Assessing the NATO/Warsaw Pact Military Balance discusses various assessments of that balance. These evaluations provide much of the basis for determining U.S. requirements for general purpose forces and, therefore, much of the rationale for raising or lowering the defense budget.

The paper is the first in a series of Budget Issue Papers to be published by the Congressional Budget Office intended to describe and analyze the U.S. military role in NATO. Related papers include an overview and analyses of firepower, air defense, and logistics.

The study was prepared by James Blaker and Andrew Hamilton of CBO's National Security and International Affairs Division under the supervision of John E. Koehler. The authors were assisted by Mary Tietz, Nancy J. Swope and Patricia J. Minton. Portions of the manuscript were edited by Johanna Zacharias, Robert L. Faherty, and D. Park Teter. In accordance with CBO's mandate to provide objective analysis, this paper offers no recommendations.

Alice M. Rivlin
Director

December 1977

CONTENTS

TABLES

FIGURES

SUMMARY

What is the military balance between the NATO nations and those of the Warsaw Pact? Observers of the situation disagree. For example, there is no consensus about the balance along the crucial Central Front--the border dividing West Germany from Eastern Europe: some analysts have described the balance there as essentially even; others contend that Pact forces outweigh NATO strength by a ratio of two to one or more. And simulations of combat in Europe yield equally varied results. Some suggest that the NATO forces could easily stave off a Pact attack, while others see them going down to a quick defeat.

Why is there such disparity among the assessments? The major sources of disagreement appear limited in number. They also seem to be based less on actual information than on a relatively small array of assumptions and judgments. Those assumptions and judgments are often implicit, and many involve political, not military, questions.

Different evaluations of the NATO/Pact balance can ultimately lead to very different implications for the U.S. defense budget. As an aid to understanding these discrepancies, this paper tries to describe why assessments can differ so much--how experts, equipped with the same information, can disagree about whether the military balance is advantageous or disadvantageous from NATO's standpoint. The study is designed to help identify what drives analysts toward optimistic or pessimistic conclusions.

THE AREAS OF AGREEMENT ABOUT THE NATO/WARSAW PACT BALANCE

Most analysts base their assessments on similar estimates of NATO and Warsaw Pact resources, summarized in the table that follows. The table shows the NATO nations' overall edge in population and gross national product and the similarity between the two sides in military manpower and ground forces strength. It also demonstrates that the USSR clearly dominates Pact strength, in contrast to the United States, which provides less than half of all NATO's resources.

The focus of most assessments is the Central Front in Germany (see map on page xi). NATO and Pact forces are most

30-908 O - 78 - 2

BASIC NATO/WARSAW PACT RESOURCES, CALENDAR YEAR 1977

Resources	NATO		PACT	
	U.S.	Other	USSR	Other
Population (millions) a/	217	(+) 346	258	(+) 108
Totals	563		366	
Gross National Product (dollars in billions) b/	1,692	(+) 1,762	922	(+) 316
Totals	3,354		1,238	
Military Manpower (thousands) c/	2,088	(+) 2,734	3,675-4,425	(+) 1,077
Totals	4,822		4,752-5,502	
Ground Forces Manpower (thousands) d/	920	(+) 1,858	1,837	(+) 797
Totals	2,778		2,634	

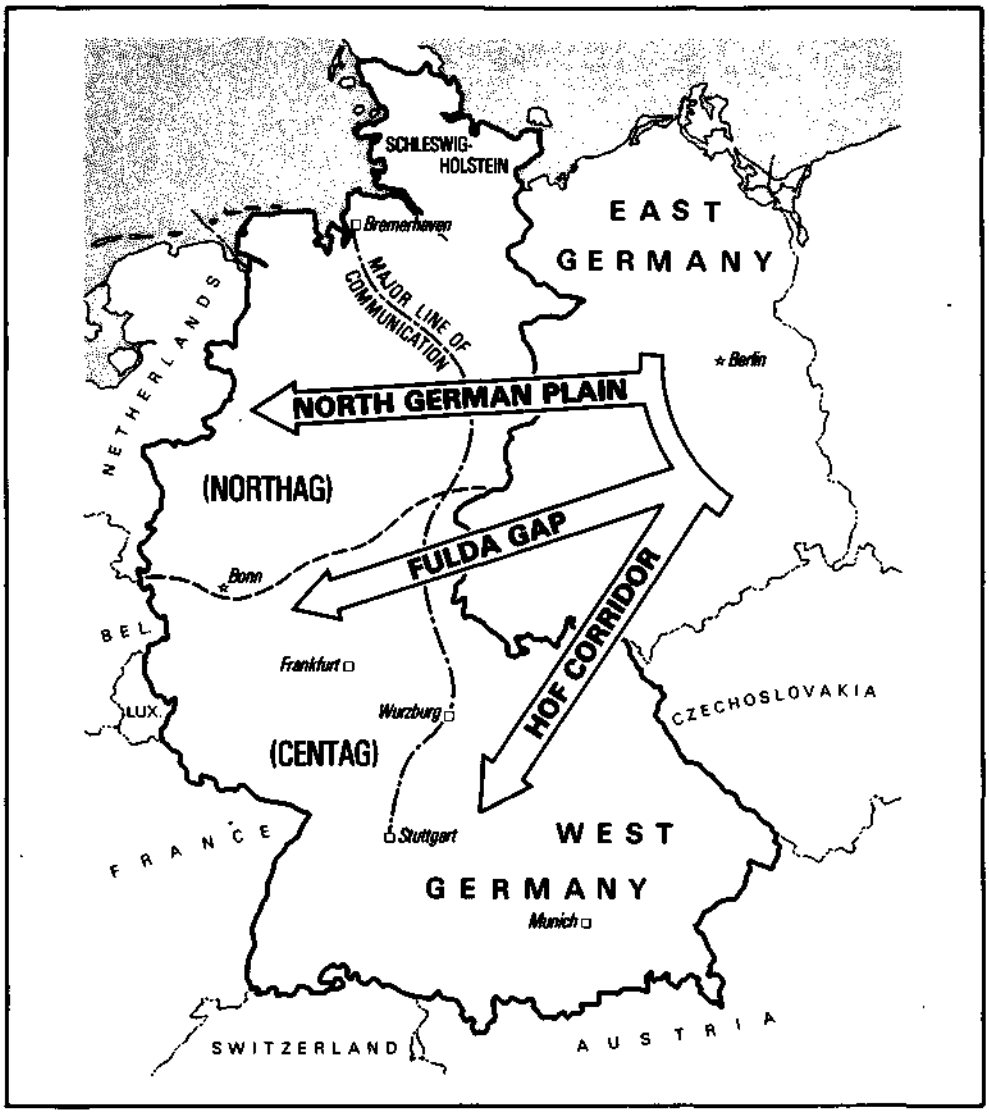
a/ International Institute for Strategic Studies (IISS), The Military Balance, 1977-1978 (London: 1977).

b/ Source for NATO: IISS, The Military Balance, 1977-1978. Source for Pact: U.S. Central Intelligence Agency, Handbook of Economic Statistics, 1977 (Research Aid ER-77-10537), September 1977, p. 31.

c/ The lower number in the Soviet range is from The Military Balance, 1977-1978, p. 8. The higher number, conforming to published official U.S. estimates, includes 750,000 personnel described by The Military Balance, 1977-1978 as "uniformed civilians," p. 8.

d/ See IISS, The Military Balance, 1977-1978. Includes Marines and naval infantry.

Likely Avenues of Attack by Warsaw Pact Forces



SOURCE: Adapted from Richard Lawrence and Jeffrey Record, *U.S. Force Structure in NATO* (Washington, D.C. The Brookings Institution, 1974) p. 31.

a/ NORTHAG refers to Northern Army Group, an area of command including Belgian, British, Dutch, and German forces, in addition to one newly formed U.S. brigade.

b/ CENTAG refers to Central Army Group, an area of command including U.S., German, and Canadian forces.

heavily concentrated there, and there is general agreement on how the military power of the two sides is deployed. NATO forces are arranged by sectors running north to south with most of their ground strength found in the Central Army Group (CENTAG) in southern Germany, where most U.S. forces are stationed. Soviet divisions in Germany make up the cutting edge of the Pact forces. These are designated the Group of Soviet Forces in Germany (GSFG). The location of the GSFG and the terrain of the Central Front region both give rise to the general belief that a Pact offensive would be across the North German Plain. As they proceeded across the Northern Army Group (NORTHAG), they would encounter German, British, Belgian and Dutch forces, and a single U.S. brigade. If they traversed the Fulda Gap and Hof Corridor (in CENTAG), the main NATO opposition would come from German and U.S. forces.

Most analysts agree on the major differences between NATO and Warsaw Pact forces. NATO's forces are less standardized than the Pact's; they vary more in size and type, in equipment, and in logistics systems. U.S. techniques and doctrine do not dominate the NATO forces. In contrast, the Soviet Union dominates military organization, doctrine, and equipment on the Pact side. Armored divisions are the core of the Pact's strength: the Pact forces' ground force structure and doctrine emphasize high-speed, offensive operations.

All these elements underlie a shared recognition of a major danger facing NATO: that Warsaw Pact forces could take advantage of the weakest aspects of NATO's posture by exploiting the attacker's initiative. That is, given that the Pact nations can choose when and where to attack, they would probably strike NATO's weakest areas. These vulnerable spots are in the Belgian, British, and Dutch sectors of the North German Plain, where the terrain is best suited to armored advances. Here NATO's forces are relatively less able to meet the challenge. 1/ A Pact thrust into this area could sever the main artery of communication to the U.S. and German forces in southern Germany.

Finally, most analysts voice one caveat: that assessments are artifacts, created to impose simplicity and order on something that in reality is complex.

1/ For a detailed explanation of the NATO conventional force posture, see forthcoming CBO papers on U.S. Conventional Forces and Participation in NATO: Air Defense, Firepower, and Logistics.

THE AREAS OF DISAGREEMENT

Consensus breaks down on two main points: how the military resources of the two sides would be brought to bear on the Central Front, and how effective the opposing forces would be in combat. With respect to NATO's posture, views on these questions range from outright pessimism to relative optimism.

This divergence stems from a limited number of issues, however. Some are military in nature, such as the merits of different ways of replacing losses; others involve political judgments, such as whether French forces would be involved in the defense of West Germany. But they all revolve around whose forces should be counted, what elements of those forces belong in the tally, how well the forces would operate, and when they should be counted.

Whose Forces Are Counted?

Debate centers on whether or not to include French forces in the NATO count. Proponents for including them stress the French forward deployments in Germany and continued exercises with other NATO forces. On the other side are arguments that stress the uncertainty of French commitment and the difficulty of reintegrating French forces to the NATO command structure. Including French resources on the NATO side can be significant, particularly in terms of manpower. Depending on whether and how many French forces are included, for example, the ratios of NATO to Pact ground forces at the Central Front can be reversed--from about 1.2:1 in the Pact favor to the same ratio in NATO's favor.

What Forces Are Counted?

Assessments vary in how they believe the USSR would reinforce its troops in Germany--the GSFG. Analysts also differ on whether nonregular forces--particularly the West German Territorial Army--should be tallied. Those arguing for large Soviet reinforcements stress the importance of the Central Front to the USSR and believe that the Soviets would accept risks on other borders to achieve superiority there. Opponents of this view stress Soviet fears of any invasion at all, and point out the difficulties involved in the required movements. Advocates of counting the 500,000-man German Territorial Army stress its combat capabilities and speed of mobilization; the counterarguments cite the German Territorial Army's assigned missions of rear security and logistics.

Measures of Effectiveness--How Well Forces Operate

Judgments about the quality of forces enter assessments in at least three ways.

The choice of comparative technique tends to promote either pessimism or optimism regarding the balance. Some methods for reducing different forces to a common comparative base tend to favor the Pact. Others give greater weight to NATO strengths.

Because not all the facts are known, many assumptions about capabilities have to be made. This often results in giving Pact forces the edge.

NATO and Pact nations approach similar military problems differently. Depending on how these different approaches are evaluated, either Pact or NATO strengths can be emphasized.

Assumptions About Timing

How fast can each side build its force levels? This is another major area of debate. The component issues in this question are how long it takes to assemble, train, and get forces ready to move, and then, how long it takes to get them ready to fight. Analysts arguing for a strong Pact advantage stress route capacities in Eastern Europe. On the other side, analysts point out command and control difficulties.

THE ROLE OF JUDGMENT

Clearly, from NATO's standpoint, there are pessimistic and optimistic interpretations of the military balance. In either category, most assessments are internally consistent and self-reinforcing. And both stances are usually founded on political and cultural aspects that are difficult to quantify.

Pessimistic assessments tend to denigrate NATO's ability to adjust its forces rapidly along the Central Front to fortify areas of weakness. Such assessments derive from positive judgments of the relative efficiency of the Pact political/military system. This attitude reinforces conservative assumptions, and it is often characterized by comparative techniques and measures of effectiveness that give heavy weight to Pact strengths. Spokesmen for this position often use a symmetrical framework, comparing tanks to tanks or artillery to artillery, without considering how

the various forces would be used. They tend to concentrate on scenarios built around a Pact attack with little warning; these are justified by the emphasis on Pact efficency and reinforce arguments against counting French and other resources on the NATO side.

Optimistic assessments rest on arguments that NATO could adjust its forces to fortify weak spots. Such evaluations see the Pact system as cumbersome and defensive. Instead of comparing common military resources, proponents of this view ask how well each side could pursue its own strategy. They adopt measures of effectiveness and comparative techniques that point up NATO strengths, and they seek to apply the same constraints to both sides. Optimistic assessments tend to come from scenarios that stress relatively longer warning of a Pact attack. This attitude is justified in part by the negative view of Pact efficiency, and it tends to support arguments for including high numbers of military resources on the NATO side.

When reduced to numbers, the two general outlooks evoke very different images. Pessimists, arguing that the Pact nations could quickly mobilize a high level of force against a NATO hindered in its response, can point to strength ratios that clearly lean toward the Pact. An optimist can describe a much more even balance. This is illustrated by the following table, which reduces the various assumptions to combat strength ratios at various points during a buildup. According to a consistent pessimist, NATO could face the kind of front-wide strength ratio that would make a conventional defense tenuous at best. Many analysts argue, for example, that with the kind of overall force ratios portrayed by the pessimistic view, the Pact could marshal a localized strength edge of 12:1 against a single NATO corps area. To an optimist, the ratios faced by NATO appear far less frightening, within the range where neither side could be sure of success.

ASSESSMENTS IN HISTORICAL PERSPECTIVE

The official U.S. view of the NATO/Warsaw Pact military balance shifted from pessimism in the 1950s to optimism in the 1960s. In the 1970s it seems to have slipped back toward pessimism--far back enough to worry some defense planners about NATO's chances of defeating or deterring a Pact attack.

As long as relatively cheap nuclear forces seemed a sufficient deterrent to attacks in Europe, the particulars of the USSR's conventional forces were of little concern to policymakers.

THE BALANCE OF GROUND FORCES ON THE CENTRAL FRONT ACCORDING TO PESSIMISTIC AND OPTIMISTIC ASSESSMENTS

Assessments	Size of Warsaw Pact Threat After 30 Days Mobilization	Warsaw Pact/NATO Force Ratio a/ M-Day b/	M+14 b/	M+30 b/
Pessimistic c/	128 Divisions	1.5	2.4	2.4
Optimistic d/	85 Divisions	1.4	1.6	1.4

SOURCES: Derived from Lucas Fischer, Defending the Central Front: The Balance of Forces (London: International Institute for Strategic Studies, Adelphi Paper No. 127, Autumn 1976), pp. 8, 11, 23. For alternative assumptions and data, see John M. Collins, "American and Soviet Military Strength, Contemporary Trends Compared, 1970-76," in Congressional Record (August 5, 1977), pp. S14096-99.

a/ Refers to strength of combat units; assumes NATO begins mobilizing one week after Pact starts.

b/ M-Day is the first day of mobilization. M+14 is two weeks after the start of mobilization; M+30 is one month after mobilization.

c/ Major assumptions include rapid reinforcement of GSFG by Soviet forces elsewhere; does not count German territorial forces on NATO side; delayed entrance by French forces to NATO posture.

d/ Major assumptions include delays in Soviet reinforcements; early entrance by French forces to NATO posture; counts German territorial forces on the NATO side.

Analysts took a pessimistic view and funding for U.S. conventional forces was low. In the 1960s, as the risks of nuclear war appeared to mount, analysts took a closer look at the threat. Funding for more costly conventional forces went up and assessments became brighter. After the relative optimism of the 1960s, assessments in the 1970s became more pessimistic following changes in Warsaw Pact forces. Recent increases in funding are justified in part on the view that NATO has to match Pact improvements if a viable conventional defense is to be maintained.

SOME CONCLUSIONS

No assessment of the NATO/Warsaw Pact balance can be called valid or invalid simply because it is relatively pessimistic or optimistic. Comparing assessments, and viewing them with some historical perspective, however, suggest the following.

The brighter assessments are optimistic only in comparison with more pessimistic ones. Few if any of the numbers or ratios used in them demonstrate a clear NATO advantage. They do, however, suggest a closer balance between the two sides and, in this, imply that Pact aggression would have much less chance of success than is implied by pessimistic assessments.

Analysts with both optimistic and pessimistic views point to the importance of what U.S. allies in NATO do or do not do. They agree that two principal variables in the balance are what the USSR does and what U.S. allies do. How they portray these variables is the main difference between the assessments.

Balance assessments are likely to go on being presented as major rationales either for increasing or decreasing the defense budget. To date, most of the assessments presented to the Congress have been devoted to comparisons of things--people, weapons, or units--in what is known as "static bean counts." These help simplify the real complexity in the military relationship between NATO and the Warsaw Pact nations. If they are presented at different times, they can give a sense of how the relationship is changing. But judgments based on bean counts about how an actual conflict would turn out can be very unreliable. So-called "dynamic assessments"--war games or other simulations--probably offer more insight because they concentrate on change and process. Dynamic assessments, too, are extremely limited predictors. Indeed, with the kind of balance assessments that have been most prominent--either static bean counts of weapons or dynamic simu-

30-908 O - 78 - 3

lations--actual battles would be hard to explain. By their criteria, France and Britain should have defeated Germany handily in 1940.

There are some technical conclusions as well.

In general, the more assessments move away from gross numbers of units or weapons systems and try to portray interactions, constraints, and capabilities, the more optimistic they become. This is particularly so in comparisons of air forces. This in turn suggests that, to the extent balance assessments attempt to integrate the impact of air forces with the ground force balance, they become less pessimistic. Such an integration implies going beyond simple counts to some sort of a calculus that converts aircraft capabilities into something comparable to ground force effectiveness (such as casualties, lethality, or destructiveness). At present, there is no agreed upon method for such comparisons. But efforts in this direction go on, and to the extent they succeed, the perceived balance is likely to become more favorable to NATO.

Balance assessments are coming under increasing criticism from the very analysts who formulate them. Criticism is arising from the recognition that superior resources have not always determined success on the battlefield. The future of balance assessments, therefore, probably lies in the analysis of command and control, the impact of different organizational concepts, and doctrine and decisionmaking on both sides of the balance. These are the areas from which optimism or pessimism have arisen, but they are also the areas in which relatively little work has yet emerged.

In the future, however, the Congress is likely to hear less about bean counts and more about comparisons of command and control, military organization, and the doctrines behind decisions.

CHAPTER I. INTRODUCTION

For more than two decades, perceptions of the military balance between NATO and the Warsaw Pact have been a major determinant of U.S. force requirements and have affected Congressional debate and action on the defense budget. The Congress is presented an official assessment of the military balance each year by the Secretary of Defense, intended in part to justify the department's funding requests. Other views of the balance come from a wide range of sources. These also seek to motivate Congressional action on the defense budget, often in different directions than those sought by the Executive Branch.

Influencing the budget debate is only one of the contexts in which balance assessments are employed. Within the Executive Branch, assessments of the balance are used not only to show broad trends, but also to discover the capabilities and weaknesses of current forces, to test the effects of changes in the mix of resources, and to define future requirements.

Most assessments begin from the same information on the military resources of the major actors. But there is much less agreement about how each side would bring its resources to bear on the critical Central Front in Europe--that area roughly defined by the line dividing West Germany from Eastern Europe. 1/ These divergent assessments of the Central Front balance often lead to very different images of the overall NATO/Pact balance and, thereby, to very different implications for defense.

1/ The ground forces balance on the Central Front has been the focus of most assessments for both political and military reasons. The major portions of both NATO and the Pact's military resources are oriented toward this area. The area extending east and west from the Front has been the key to the military and political character of Europe since the turn of the century. And ground forces--more often than air or naval forces--are determinants of political boundaries. Recognition of these points is the reason that the major negotiations between NATO and the Warsaw Pact--on mutual and balanced force reductions (MBFR)--focus on the area associated with the Central Front.

AREAS OF AGREEMENT

Tables 1 and 2 summarize the rough dimensions of the generally agreed upon overall balance of NATO and Pact resources. The first table shows that NATO collectively outnumbers the members of the Warsaw Pact by more than 200 million people and has nearly three times the gross national product (GNP) and 70 percent higher GNP per capita. As Table 2 shows, however, the Pact has roughly the same number of personnel under arms as NATO, despite a smaller population and economy. The table also portrays the Soviet preeminence in Pact military resources—the USSR provides roughly 80 percent of the Pact's total military manpower and more than half of the Pact's ground forces strength. In comparison, U.S. military strengths are roughly 43 percent and 33 percent of NATO's overall military and ground strength totals, respectively.

There is also agreement regarding the general manner in which these resources are structured, and nearly all observers recognize the major differences between the two sides. NATO, for example, is generally characterized as less standardized than the Pact, having much greater variation than the Pact in terms of the types and sizes of units, equipment, and the logistics systems that support them. Likewise, there is no debate over how NATO's forces are deployed. 2/ It is common knowledge that the forces of the NATO Central European Command include 26 divisions, assigned by Belgium, Great Britain, Canada, West Germany, the Netherlands, and the United States. 3/ And most observers recognize that the mass of NATO ground strength lies with the West German and U.S. divisions of the Central Army Group (CENTAG) in southern Germany (see Figure 1).

Likewise, nearly all analysts accept the view that the Pact is essentially an instrument of Soviet power in Europe and that Pact military organization, doctrine, and equipment is dominated by the USSR. They identify Pact armored divisions as the core of the Pact's ground force strength and agree that Pact ground force structure and doctrine reflect a deliberate preparation for high-speed offensive operations.

2/ Considerable discussion and debate does exist over how they might better be deployed. See, for example, the CBO studies of U.S. options for NATO, forthcoming.

3/ International Institute for Strategic Studies (IISS), The Military Balance, 1977-1978 (London: 1977), p. 17.

TABLE 1. MAJOR NATO/WARSAW PACT RESOURCES: POPULATION AND GROSS NATIONAL PRODUCT IN 1976

NATO		PACT	
	Population (millions)		
United States	217	258	Soviet Union
N. Central/W. Europe a/	203	67	N. Central/E. Europe b/
Other NATO c/	143	41	Other Pact d/
NATO Total	563	358	Pact Total
	Gross National Product in 1976 (billions of dollars)		
United States	1,692	922	Soviet Union
N. Central/W. Europe a/	1,215	216	N. Central/E. Europe b/
Other NATO c/	447	100	Other Pact d/
NATO Total	3,354	1,238	Pact Total

SOURCES: For population figures, International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977). For GNP of Warsaw Pact nations, U.S. Central Intelligence Agency, Handbook of Economic Statistics, Research Aid ER-77-10537, September 1977, p. 31. For GNP of other nations, The Military Balance, 1977-1978.

a/ Includes Belgium, Britain, Denmark, Federal Republic of Germany, France, Luxembourg, the Netherlands.

b/ Includes Czechoslovakia, German Democratic Republic, Poland.

c/ Includes Canada, Greece, Italy, Norway, Portugal, Turkey. Excludes Iceland.

d/ Includes Bulgaria, Hungary, Romania.

TABLE 2. MAJOR NATO/WARSAW PACT RESOURCES: ACTIVE MILITARY AND GROUND FORCES

NATO		PACT	
	Active Military (thousands)		
United States	2,088	3,675 - 4,425	Soviet Union a/
N. Central/W. Europe b/	1,561	645	N. Central/E. Europe c/
Other NATO d/	1,173	432	Other Pact e/
NATO Total	4,822	4,752 - 5,502	Pact Total
	Ground Forces (thousands)		
United States	920	1,837	Soviet Union
N. Central/W. Europe b/	1,016	460	N. Central/E. Europe c/
Other NATO d/	842	337	Other Pact e/
NATO Total	2,778	2,634	Pact Total

SOURCE: The Military Balance, 1977-1978. Includes Marines and naval infantry.

a/ The lower number is cited by The Military Balance. The higher number, conforming to published official U.S. estimates, includes 750,000 personnel described by The Military Balance as "uniformed civilians."

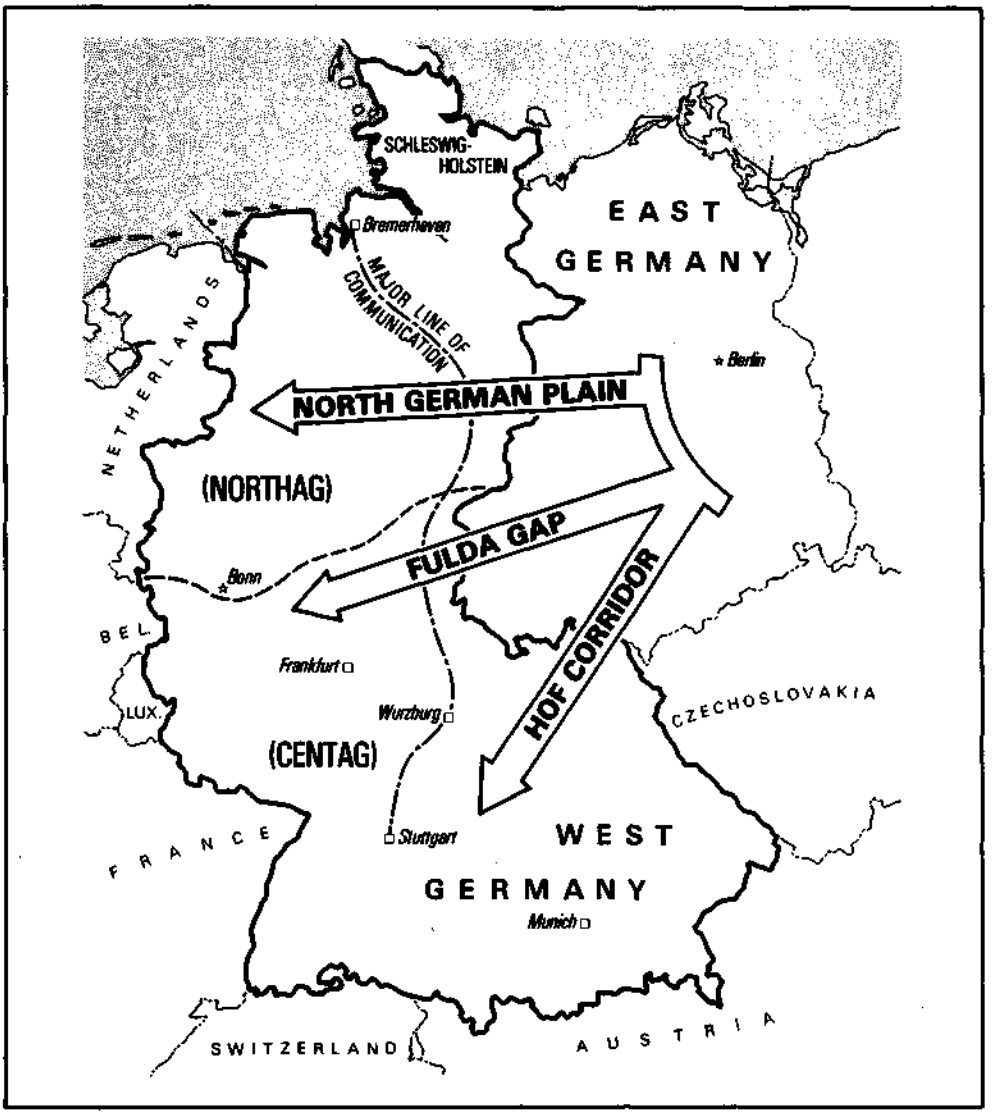
b/ Includes Belgium, Britain, Denmark, Federal Republic of Germany, France, Luxembourg, the Netherlands.

c/ Includes Czechoslovakia, German Democratic Republic, Poland.

d/ Includes Canada, Greece, Italy, Norway, Portugal, Turkey. Excludes Iceland.

e/ Includes Bulgaria, Hungary, Romania.

Figure 1.
Likely Avenues of Attack by Warsaw Pact Forces



SOURCE: Adapted from Richard Lawrence and Jeffrey Record, *U.S. Force Structure in NATO* (Washington, D.C. The Brookings Institution, 1974) p. 31.

a/ NORTHAG refers to Northern Army Group, an area of command including Belgian, British, Dutch, and German forces, in addition to one newly formed U.S. brigade.

b/ CENTAG refers to Central Army Group, an area of command including U.S., German, and Canadian forces.

The cutting edge of the Pact's offensive capability is seen as the 27 Soviet divisions, of which 20 are stationed in East Germany and collectively designated the Group of Soviet Forces in Germany (GSFG). The location of these units, half of them armored divisions, is generally viewed as evidence that the primary axis of Pact advance would be across the North German Plain (in the NORTHAG region of NATO under the area responsibility of West Germany, Great Britain, Belgium, the Netherlands, and a single U.S. brigade) or through the Fulda Gap and Hof Corridor (in NATO's CENTAG region where West German and most U.S. forces are deployed).

All these elements combine in a general consensus regarding NATO's major strategic problems. Assessments recognize that the Pact has the initiative in the time and location of an attack. As such, the Pact could choose to strike at the area of greatest weakness in NATO—the North German Plain. NATO forces in this area are relatively weaker than those stationed in CENTAG, and the terrain favors the movement of armored forces. Thus, most assessments recognize that the balance may hinge, not on the Central Front as a whole, but on a localized area, north of where the bulk of U.S. forces are currently deployed.

Finally, most assessments recognize their fundamental limitations. All assessments are artifacts. They are created to add order and simplicity to something that is inherently complex, obscure, and changing. As such, they cannot portray fully the nuances of perception, the elements of uncertainty, or the processes of change that characterize the entire relationship between NATO and the Warsaw Pact. And while static assessments of the forces on both sides and dynamic simulations of their interactions can help clarify the actual balance, they cannot fully capture the confusion of actual war nor predict its outcome with high reliability.

AREAS OF DISAGREEMENT

Yet, beyond these dimensions of agreement, assessments vary greatly about how resources would be marshaled for combat on the Central Front and how the military balance should be portrayed. The ratio of opposing forces across the entire Front, for example, has been described as anywhere from about even to 2:1 or more in favor of the Pact. The Pact has been described as having overwhelming strength in some measures of military capability and, alternatively, as clearly deficient vis-a-vis NATO in other categories of force. And NATO's capability to deter or defeat a

Pact attack on the Central Front has been presented in both optimistic and pessimistic terms.

Review of divergent assessments suggests, however, that the differences are caused by a limited number of major variables. It also indicates that the contrasting images of the balance are rooted in nonquantifiable assumptions regarding political, social, and cultural factors. This paper seeks to explain the differences.

Chapter II identifies the key factors involved, describes the issues surrounding each, and illustrates how analytic decisions on these issues push assessments toward relative optimism or pessimism.

Chapter III provides explicit examples of both optimistic and pessimistic assessments and attempts to show how each type becomes internally consistent and conceptually valid given certain key assumptions, many of which are not easily subjected to systematic verification.

Chapter IV adds some historical perspective to the art of assessing the balance. It portrays how the official assessments have changed over the last two decades and suggests how the perceptions they generated may have been translated into budget decisions. It also outlines some of the limits of balance assessments as tools for setting requirements.

Chapter V provides some conclusions.

The Appendix, included at the end of this paper, provides some more detailed discussion of the major analytic techniques on which balance assessments are based.

30-908 O - 78 - 4

CHAPTER II. THE EFFECT OF DIFFERENT ASSUMPTIONS

In the NATO/Warsaw Pact balance assessments of the last decade, most of the differences derive from four variables:

- o Whose forces are counted;
- o What forces are included in the counts;
- o Assumptions regarding the quality of the forces; and
- o Assumptions regarding timing. 1/

Most of the debate on each variable centers on a limited number of issues. This section identifies the key issues and illustrates how different judgments on these issues lead to different balance assessments. The examples used are at the heart of nearly all balance assessments and determine whether the image the assessment generates will be optimistic or pessimistic.

WHOSE FORCES SHOULD BE COUNTED?

Few comparisons of the balance in Central Europe include the total membership of both the Warsaw Pact and NATO. 2/ Tallies

---

1/ The timing variable is actually a function of the other three variables. But it plays such a key role in assessments that it is worth looking at in some detail.

2/ Some analysts argue that Denmark's forces should be included in portraying the Central Front balance on the grounds that they are more closely linked to this front by land routes than they are to the Northern Front, where NATO officially lists them. See, for example, Robert Lucas Fischer, Defending the Central Front: The Balance of Forces (London: International Institute for Strategic Studies, Adelphi Paper No. 127, Autumn 1976), p. 7. Potential inputs from non-NATO West European nations are noted in Stanley R. Sloan, Some Perspectives on the NATO-Warsaw Pact Balance (Washington, D.C.: Congressional Research Service, 76-83F, April 2, 1976), pp. 21-23.

of Pact strength generally exclude Romanian, Hungarian, and Bulgarian resources, while Portugal, Turkey, Italy, Norway, and Greece are usually left out of NATO tallies. Some debate involves how to count Danish forces and non-NATO West European countries, but their numerical significance is relatively low.

France is another matter. The French army is about the same size as the West German army (about 330,000 for the French; about 345,000 for the Germans) and is significantly larger than that of any Warsaw Pact nation other than the USSR. Thus, including France in calculations of the balance can change the results substantially, particularly if the comparison is based on manpower. As shown in Table 3, French forces can reverse an unfavorable manpower ratio for NATO to a favorable one. 3/

The inclusion of French resources other than manpower does not have as dramatic a result, although the 557 combat aircraft in the French air force, plus the 111 combat aircraft in their navy 4/ are more than the aircraft inventories of East Germany and Czechoslovakia. France's 56 major surface combat vessels represent about one-fourth of the Soviet inventory of major surface combatants, expressed in tonnage. 5/

There are arguments for and against including French resources in balance assessments. Some analysts emphasize that French forces are not under NATO command and argue that, even in the event of war, they could not be reintegrated into the NATO structure easily. 6/ Other analysts include the French in their

---

3/ Subject, of course, to how many of the French forces are included in NATO tallies and, on the Pact side, how many Soviet forces are included.

4/ International Institute for Strategic Studies (IISS), The Military Balance, 1977-1978 (London: 1977), p. 23.

5/ To compare fully loaded tonnages of aircraft carriers, cruisers, destroyers, and frigates, see Jane's Fighting Ships (London: Jane's Yearbooks, 1976-1977), pp. 147-162, 685-717.

6/ John M. Collins, "American and Soviet Military Strength, Contemporary Trends Compared, 1970-76," Congressional Record (August 5, 1977), p. S14098; IISS, The Military Balance, 1977-1978, p. 103.

TABLE 3. TOTAL REGULAR ARMY MANPOWER: a/ IN THOUSANDS

NATO		PACT	
Belgium	64	Czechoslovakia	135
Britain	58	East Germany	105
Canada	3	Poland	204
Netherlands	75 b/	USSR	455
United States	193		
West Germany	345		
Subtotals	738		899
FORCE RATIO: 1.2:1 in Pact favor			
France	330 c/		
Totals	1,068		899
FORCE RATIO: 1.2:1 in NATO favor			

a/ Derived from Robert Lucas Fischer, Defending the Central Front: The Balance of Forces (London: International Institute for Strategic Studies, Adelphi Paper No. 127, Autumn 1976).

b/ International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977), p. 7.

c/ Ibid., p. 22.

calculations in the belief that France could not afford to stay out of a fight and that its military forces could be reintegrated rapidly into the NATO command structure, particularly in a situation in which a conflict were preceded by a period of tension or crisis. These analysts stress the fact that the French deploy about 50,000 troops in Germany (including about 2,000 in Berlin) and have continued to participate in joint planning with NATO commanders. 7/

7/ Alain Enthoven, "U.S. Forces in Europe: How Many? Doing What?" Foreign Affairs (April 1, 1975), p. 517; IISS, The Military Balance, 1977-1978, p. 23.

No real analogue to the French case exists on the Pact side of the equation. Some analysts, however, doubt that all available Pact forces would play an active role in an offensive. Their views stem as much from the disposition of Soviet troops in Eastern Europe as from the post-World War II history of Soviet-East European relations. The current posture of Soviet ground units can be described in part as protecting sensitive areas from the populations and the armed forces of the non-Soviet members of the Pact. In the event of conflict with NATO, these analysts argue, the available Pact forces would be reduced by withholding some Soviet units for internal security missions and by a Soviet reluctance to trust their Pact allies with too large a combat role. Few attempts have been made to quantify this argument. But it is sometimes used to counter pessimistic analyses that exclude French forces from the NATO/Warsaw Pact balance. 8/

The effect on balance assessments of the choice of nationalities to be included in the counting is particularly pronounced in comparisons of naval forces. Comparisons that include only U.S. and Soviet naval forces often result in a balance that favors the USSR in most categories, especially when tonnage and qualitative characteristics of sensors and weapon systems are disregarded. The addition of allied naval forces on both sides, however, gives a very different overall result. In fact, U.S. NATO allies have more naval forces than the Pact in every category except nuclear submarines, land-based bombers with air-to-surface missiles, and amphibious lift vessels.

Such comparisons do not effectively portray the naval balance because the missions of the opposing navies are so different. 9/

8/ Enthoven, "U.S. Forces in Europe," p. 517.

9/ Naval force comparisons are particularly subject to this caveat. NATO's numerical superiority is reasonable from the perspective of mission needs because NATO depends on the sea lanes while the Pact does not. In mission terms, this implies NATO's problem is one of sea control, far more demanding on naval resources than is sea denial, a logical mission for Pact forces. Sea denial, for example, may be likened to guerilla war in which the defender (NATO) needs a preponderance of force in order to control the areas of importance. For an extended discussion, see Stansfield Turner, "The Naval Balance: Not Just a Numbers Game" Foreign Affairs (January 1977), pp. 339-54.

But tabulations like those in Figure 2 effectively illustrate the difference it makes to such balance portraits when the comparison is expanded to include more countries.

WHAT FORCES SHOULD BE COUNTED?

On the question of what forces to count, most of the debate centers around the level of regular, active forces the USSR would devote to a Central European conflict and, on both sides, the extent to which non-regular forces--territorial armies, border troops, or security forces--should be counted.

The Soviet Union currently fields at least 168 divisions (45 tank, 115 motorized rifle, and 8 airborne) in varying states of readiness. 10/ Of these, 27 (all considered to be at the highest level of readiness) are stationed in East Germany, Czechoslovakia, and Poland and are clearly assigned to the North and Central European areas. 11/ About the same number, located in the three westernmost military districts of the Soviet Union, also are believed to be oriented toward Europe. These are at various levels of readiness. This leaves roughly half the Soviet ground force structure deployed and oriented elsewhere, and while many of the divisions that constitute this pool of resources are at low levels of readiness, some are believed to be maintained at about the same levels of readiness as Soviet "front line" divisions in Eastern Europe.

By assuming that some or all of the ready divisions deployed elsewhere would be employed against NATO, the "threat" can be adjusted upward. For example, the assumption that the USSR would commit units stationed in Central Russia and would redeploy units from the southern and northern flanks and the Sino-Soviet border increases the threat facing NATO in the Central Front from roughly 85 divisions (54 Soviet, 31 other Pact) to about 126, nearly a 50 percent increase. 12/

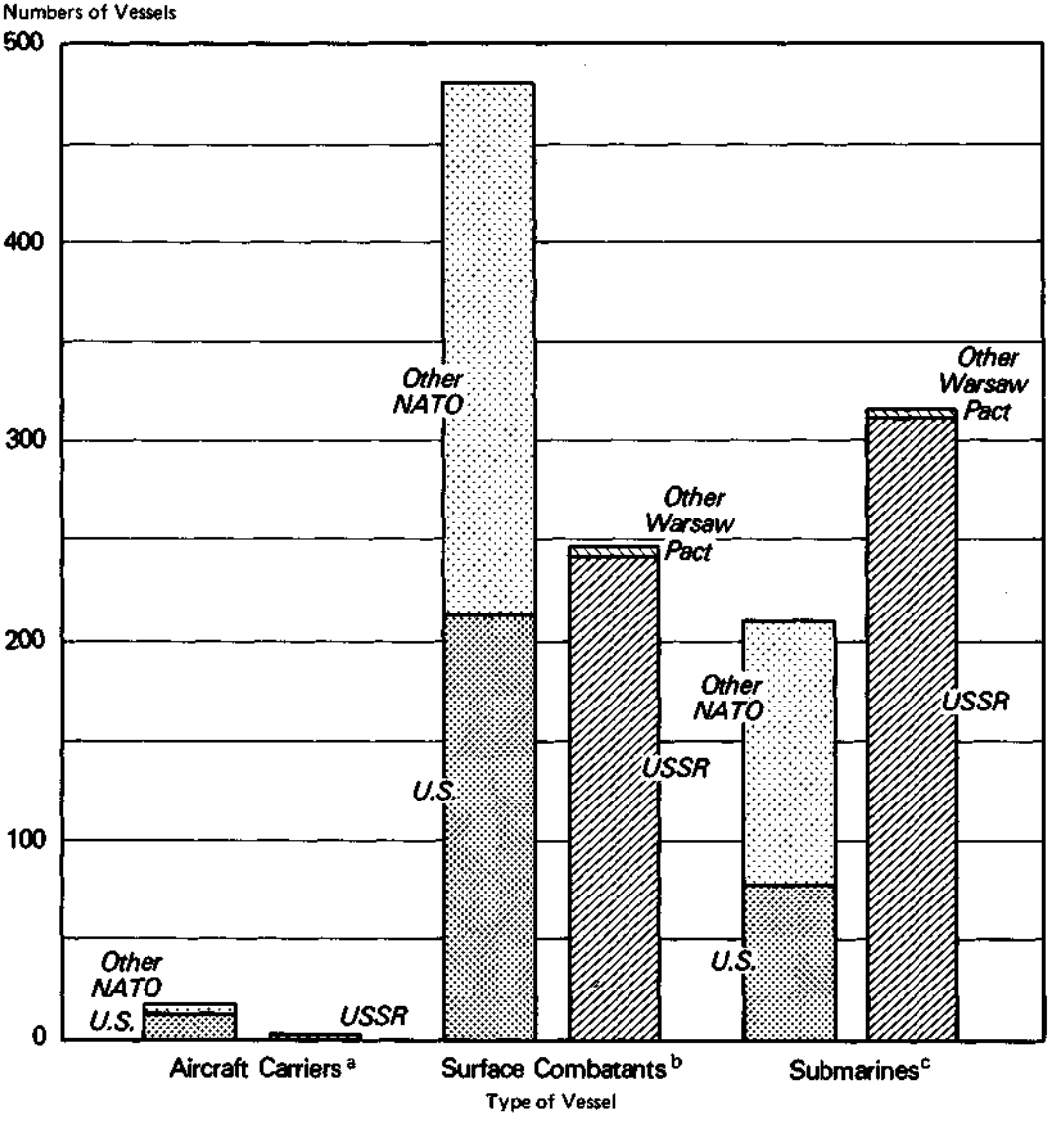
10/ IISS, The Military Balance, 1977-1978, p. 8.

11/ Secretary of Defense Donald H. Rumsfeld, Annual Defense Department Report, FY 1978, p. 94.

12/ See Michael Getler, "Study Insists NATO Can Defend Itself," Washington Post, June 7, 1973.

Figure 2.

Numbers of Major Ships in 1976, by Type --NATO/Warsaw Pact Forces



SOURCE: *Jane's Fighting Ships, 1976-1977 (London: Jane's Yearbooks, 1976).*

[a] Excludes one U.S. training carrier

[b] Includes vessels 1,000 tons or more fully loaded; includes armed coast guard vessels and the British Hermes, a helicopter assault ship.

[c] Excludes ballistic missile vessels. Of the 211 submarines on the NATO side, 74 are nuclear powered, 65 belonging to the United States, nine to other nations. On the Warsaw Pact side, there are 80 nuclear powered submarines, all belonging to the USSR.

In support of the higher, or "augmented," threat, analysts point to the ratios by which Soviet forces exceed the forces facing them on the Sino-Soviet border and elsewhere. By adopting a defensive posture in Southern Europe and along the Sino-Soviet border, they argue, the USSR could free forces for use on the Central Front and still have some assurance that they could counter any offensive threats by Turkish or Chinese forces, even if these indigenous forces were reinforced by U.S. forces. 13/

Arguments against counting such Soviet forces are based on two assumptions: that the USSR simply would not risk withdrawing its forces from other locations, and that even if such an unlikely decision were made, these resources are located at such distances as to foreclose their timely movement to useful locations on the Central Front. 14/

On the NATO side of the balance, analysts similarly disagree over which forces of the NATO allies should be counted. The minimum is, of course, those forces stationed in Europe which each nation formally designates as "NATO-committed" forces in the annual NATO Defense Planning Questionnaire. In the Central Region this amounts to about 28 division equivalents, 15/ which nearly all assessments count. Beyond this, however, assessments vary. Some analysts propose a NATO level at between 40 and 50 division equivalents. They obtain this by adding dual-based U.S. forces (forces based in the United States with operating equipment in Europe) plus other U.S. forces which have been earmarked for a NATO contingency (and which can be moved to Europe rapidly), French forces, and other NATO forces which could be introduced to the Central Front rapidly. 16/ Other forces can be entered

---

13/ Ibid.

14/ Ibid.

15/ "Division equivalent" is an analytic device used to account for separate combat units smaller than a division. NATO armies usually organize by divisions, normally of three brigades, but often include separate, brigade-sized units also. Adjustments for some of these variations can be made by including these separate units as one-third of a division.

16/ See, for example, Getler's discussion of how some analysts view NATO's resources (Michael Getler, "Study Insists NATO Can Defend Itself," Washington Post, June 7, 1973).

into the equation to generate a NATO force level of up to 72 to 78 division equivalents, depending on assumptions regarding the willingness of nations to commit their forces to a NATO military buildup and the time required to do so. 17/

While several additions to the bottom line of NATO's forces are debatable, most argument concerns French divisions (see above) and the role of the West German Territorial Army. The West German Territorial Army includes about 63,000 active army personnel and over 441,000 reserves capable of quick mobilization. Charged primarily with support functions (transportation, communication, construction, etc.), it also possesses combat capabilities, concentrated in six home defense groups, each roughly equivalent to a large infantry brigade. These groups possess armor and anti-armor weapons--together about as many as the active French army--and are supported by mobile Jaeger regiments (truck-mounted infantry, tanks, and artillery). 18/

Arguments for including these forces on the NATO side of the balance stress their combat capacity, which, when reduced to a statement of firepower capability, gives the peacetime territorial forces a potency of more than one armored division equivalent. 19/ Arguments against adding the territorial forces to the NATO side of the balance stress that their primary mission is support and rear security. 20/ According to this view, they would

---

17/ Ibid.

18/ IISS, The Military Balance, 1977-1978, p. 24; Federal Republic of Germany: White Paper 1975/6, The Security of the FRG and the Development of The Federal Armed Forces (January 20, 1976), p. 113; Fischer, Defending the Central Front, p. 17.

19/ See discussion of Weapons Effectiveness Indices and firepower potentials in the Appendix. An armored division equivalent refers to an analytic means of reducing unlike units to a common standard of comparison, in effect saying "the firepower of a U.S. armored division."

20/ This view is sometimes paralleled by arguing that including German territorial forces in NATO tallies should be matched by adding border and security troops to Pact tallies. This is countered, in turn, by arguing only German territorials would actually fight, because the battle would be in West Germany.

not engage Warsaw Pact forces directly in event of war and should therefore not be included in balance assessments.

ASSUMPTIONS REGARDING QUALITY

There are three primary ways in which considerations of the quality of forces enter balance assessments: (1) in reducing unlike force structures to a common denominator for comparison; (2) in measuring the capabilities of equipment and manpower; and (3) in judging the relative effectiveness of different ways of solving military problems.

Reduction Devices

Differences in NATO and Pact forces confront analysts with the need to compare units that differ greatly in size, structure, and weapons. 21/ To make such comparisons, analysts often use techniques that reduce weapons or units on both sides to an index number. The Appendix describes two of the most prevalent means of doing this--the firepower potential method, and the weapons effectiveness index/weighted unit value (WEI/WUV) technique. Each of these methods allows judgment to enter the calculations.

Table 4 illustrates how the two methods, when applied to the same tanks and antitank weapons, generate different results. The table also provides, in the last line, a comparison of the index score ratio for the same units. The point of the table is not to suggest that one or another measure is correct, but to portray the different way the techniques can evaluate the same weapons or units.

The differences are due primarily to the relatively higher value placed on tanks by the Firepower Potential method and the relatively higher value accorded antitank and infantry by the WEI/WUV method. In short, assessments that use some methods of reducing unlike units to a common standard often credit the Pact with more potency than assessments based on the other methods, which tend to emphasize NATO strength.

21/ Differences in organization between NATO and the Pact can be illustrated by comparing the ratio of ground forces manpower to the ratio of divisions in Central Europe. Table 3 shows a similar manpower ratio; the corresponding division ratio, however, is 2:1 in the Pact's favor.

TABLE 4. COMPARISON OF MEASURES OF EFFECTIVENESS--INDEX SCORE RATIOS a/

	Firepower Potential Method	WEI/WUV Method
Tank A/Tank B	0.89	1.00
Tank/Antitank Weapon	0.43	0.76
Unit A/Unit B b/	0.60	0.52

a/ From John R. Bode, Indices of Effectiveness in General Purpose Force Analysis (Washington, D.C.: Braddock, Dunn and McDonald, Inc., BDM-74-070-TR, October 1974), pp. 52-54.

b/ Includes infantry, armored and antitank elements of different force structures.

Measures of Military Effectiveness

Limitations on data, particularly for the Warsaw Pact, are often resolved by adopting different counting or measuring rules for each side. Such asymmetries permeate most balance assessments, usually not out of conscious efforts to make one side or another look strong or weak, but because the scope, depth, and timeliness of information about the two sides of the balance often differ greatly.

In most cases, however, when different measurement rules are applied to the two sides, a conservative bias is evident. That is, in the absence of countervailing evidence, Pact capabilities are given the benefit of the doubt. Some of the most prominent examples of this tendency can be found in:

Measurements of Aircraft Range and Payloads. NATO aircraft are often measured by a more conservative standard than Pact aircraft. In assessing range and payload capacity for NATO, for example, a more demanding flight profile is often assumed for those forces than is assumed for Pact forces.

Aircraft Utilization Rates. Aircraft utilization rates for combat and transport aircraft are often treated as if equal for

both NATO and the Warsaw Pact. This may credit the Pact with better serviceability and higher crew ratios than actually exist.

Loading Assumptions. In various movement models, loading and preparation time factors are applied unequally to both sides. For some variables, such as materiel handling times, Soviet and Pact capabilities are assumed to be equal to or better than those of the United States and NATO, despite lack of evidence that the Pact has invested much in handling equipment.

Readiness Assumptions. The time required to prepare reinforcing units on both sides is often handled differently. The U.S./NATO side is sometimes penalized by more stringent conditions, such as more demanding personnel administration processes. Lower category Pact divisions are often credited with a capability for readiness sooner than comparable Western units.

Evaluations of Different Approaches to Military Problems

NATO and the Warsaw Pact often approach similar military problems in very different ways. One example is their concepts of air warfare. NATO's emphasis in the design of its aircraft, in its ground support systems, in pilot training, and in doctrine is on the initiative of the individual pilot or air crew. The Pact, in contrast, seems to limit pilot initiative, designing its aircraft and supporting systems to constrain the pilot to operate only on instructions from higher (generally ground-based) authority.

To some analysts, this difference gives NATO an edge in air warfare. If one believes that actual conflict is always accompanied by breakdowns in communication, then a greater capacity to exercise individual initiative should count as a positive factor in balance assessments. This view is sometimes reflected in war games or other dynamic assessments. For example, on the basis of such an assumption, a NATO attack on a Pact ground control facility would reduce Pact air power more than a similar attack on a NATO command facility would reduce NATO air power.

To other analysts, however, the more centralized control of the Soviet approach gives the Pact a superior capacity to mass force at crucial points and to achieve the necessary force ratios required to win air engagements.

Similar differences in judgment influence the values that analysts place on different personnel and equipment replacement

systems. NATO relies on individual replacement; the Pact relies on unit replacement. One result is that a large fraction of NATO's equipment assets are held in war reserve and maintenance stocks, 22/ while most Pact equipment is assigned directly to units. To some analysts, this gives the Pact an edge; to others, it is viewed as a limitation.

These kinds of judgments are multiplied as dynamic analysis expands into all the dimensions of a postulated conflict between NATO and the Warsaw Pact. But they are also inherent in most static assessments of the ground balance, particularly when these address the mobilization and buildup capacities of the two sides.

ASSUMPTIONS ABOUT TIMING

What forces are counted in balance assessments is a function of when the count is made. Forces "immediately available" are, of course, relevant in a number of scenarios. A "standing start" attack, or a political crisis that inhibits mobilization on both sides are both situations in which counts of standing forces would be important. But nearly all assessments of the balance allow for mobilization and reinforcement because it is difficult to imagine a war breaking out in Europe without some preceding period of tension and because the balance is affected by the time assumed for mobilization by each side.

Both NATO and the Warsaw Pact have large forces--in reserve or outside the area--that could be on the Central Front in a few weeks. A variety of factors determines how soon these forces can be ready for combat. Some of these are susceptible to relatively precise quantification. For example, once a route is identified, analysts can calculate travel distances with little disagreement. Likewise, the travel time of units can be estimated with some assurance because route capacities (whether road and rail networks or air routes) and vehicle capabilities are finite and subject to measurement. Even with the vagaries of weather and climate, estimates of movement times are relatively noncontroversial. 23/

22/ See, for example, Michael Getler, "5,000 Extra Tanks in NATO Stockpile," Washington Post (October 30, 1970), p. A1.

23/ There are differences of opinion on how long major Pact equipment can be operated before breaking down and on how long the necessary repairs would take.

More controversial, however, is the amount of time required to marshal the necessary transport, to get various units ready to move and, once they are moved, to get them ready to fight. These aspects are subject to considerable differences of opinion.

The key issue is whether differences in the time each side takes to build and adjust its forces would allow the Pact to marshal enough force to exploit successfully NATO weaknesses on the Front. The North German Plain is the area of greatest concern in this regard because terrain there is more suited to armor movements and NATO forces, as currently deployed, are relatively weaker there than in southern Germany. 24/

Whatever the assumptions made regarding warning time, mobilization speed, and readiness, the balance is generally portrayed in terms of buildup curves for the Warsaw Pact and NATO. In nearly all balance assessments, these curves assume that the Pact begins to mobilize before NATO. And for nearly a decade, a "23/30" scenario has dominated analysts' calculations of timing. In this scenario it is assumed that NATO lags the Warsaw Pact in starting

---

24/ Terrain and force deployments make three general areas of Pact attack the most likely: the North German Plain, Fulda Gap, Hof Corridor (see Figure 1). The North German Plain, lying in large part within the British and Belgain sectors of responsibility, is less hilly than the approaches to the south, but with heavy vegetation. It is separated from less densely populated areas to the west by a relatively narrow, densely settled band near Hanover. The Fulda Gap and Hof Corridor, lying predominantly within the U.S. sector of responsibility, have more of the kinds of manmade structures which inhibit the rapid movement of armored forces. In general, attacking tanks in the North German Plain would be less restricted in their movements, yet more screened from the view of defenders. A Pact breakthrough there would sever the main line of communication to the U.S. and German forces in southern Germany. For a discussion of terrain considerations, see Department of the Army, U.S. Army Field Manual 100-5; Operations (Washington, D.C.: 1976), pp. 13-15.

to mobilize by about a week and that war begins roughly a month after the Pact starts to mobilize. 25/

A scenario that had been created strictly as a planning artifact became the dominant war scenario. This gradual transformation was obscured by debate over what was the worst situation NATO might face. For it is a characteristic of the 23/30 scenario that, although the overall size of the Warsaw Pact threat begins to level out about 30 days after the Pact begins to mobilize, the Pact obtains its highest force ratio vis-a-vis NATO about two weeks into its mobilization. 26/ This characteristic pattern of the 23/30 scenario helped generate the view that the "worst case" facing NATO was a "short-warning" attack, coming roughly one to two weeks after the Pact began to mobilize. The strength of the attack was generally believed to be limited, at least in comparison to what could be mounted after an additional two or three weeks mobilization.

Within the last several years, however, some analysts have argued that the size of the threat 14 days into the mobilization (M+14) could be larger. They argue that the Warsaw Pact now has the capability to attack in Central Europe with roughly 80-90 divisions about two weeks earlier than they could have a decade ago, and that these divisions would generally be at high levels of readiness.

Thus, the debate over timing has changed slightly. Five years ago the issue was whether the Pact would attack in about two weeks with a limited force. Now the debate centers on whether the Pact would attack sooner with a larger force.

25/ Congressman Les Aspin, Congressional Record (February 7, 1977) pp. H911-12. The 23/30 scenario was originally formulated for force planning purposes and, at the time, was not a forecast or prediction of how a war might actually begin. The 30 days allowed for the Warsaw Pact to mobilize was consciously selected by U.S. force planners to allow a significantly sized threat to be generated. U.S. planners initially argued that this level of threat constituted a built-in hedge against sizing U.S./NATO forces against too small a threat, but over time some analysts increasingly tended to regard the 30-day Pact mobilization period as a prediction.

26/ Derived from Fischer, Defending the Central Front, p. 24.

This issue still revolves around data regarding readiness and command and control. Those arguing on behalf of an early attack (7 to 14 days after mobilization) by about 85 Pact divisions rely heavily on evidence indicating improved road and rail capacities in Eastern Europe. They tend to disregard command and control problems during movement (the movement of forces required to mass 85 divisions would involve division- and corps-size units transferring across each other's lines of supply) and to ignore potential problems in getting units ready to move and into position after the move. These problems are stressed by analysts who doubt the Pact's ability to attack with 85 divisions in two weeks. They point to the difficulty of bringing a sizable number of Category II and Category III Pact divisions to combat readiness in a short time, 27/ the problems of establishing the command and control structures necessary to mount a large-scale attack, historical evidence, 28/ and problems encountered by large-scale movements of U.S. and other NATO forces.

Assumptions regarding the speed of Pact mobilization affect balance assessments greatly. For example, assuming the Pact could mass about 85 divisions in 14 days rather than 30 days changes the resultant force ratio at M+14 to about 2:1 in the Pact favor rather than 1.6:1. This change crosses a threshold identified by Defense Secretary Donald H. Rumsfeld as a major planning criterion. 29/

Assumptions on when NATO would begin to mobilize also make a big difference. Using the same scenario in which 85 divisions attack at M+14, but assuming that NATO, because of an inability to make the decision, begins to mobilize two weeks after the Pact, improves the Pact edge to about 2.2:1. Assuming NATO starts to mobilize at the same time as the Pact reduces the Pact advantage at M+14 to 1.5:1. The effect of varying assumptions on threat size, mobilization period, and warning time is illustrated in Table 5, where the measure used is men in combat units on both sides.

27/ Congressman Les Aspin, Congressional Record (February 7, 1977), pp. H911-12.

28/ Ibid., pp. H912-13.

29/ Secretary of Defense Donald H. Rumsfeld, Annual Defense Department Report, FY 1978, p. 94.

TABLE 5. PACT/NATO FORCE RATIO 14 DAYS AFTER PACT MOBILIZATION a/ (STRENGTH OF COMBAT UNITS)

Size of Pact Threat at M+14	Pact/NATO Ratio if NATO Mobilizes		
	Simultaneously	7 Days Later	14 Days Later
75 Divisions	1.3	1.6	1.9
85 Divisions	1.5	1.9	2.2

a/ Derived from Robert Lucas Fischer, Defending the Central Front: The Balance of Forces (London: International Institute for Strategic Studies, Adelphi Paper No. 127, Autumn 1976), pp. 8 (Table 3), 11 (Table 5), 23 (Table 7).

The significance of these ratios depends a great deal on one's assumption regarding the ratio of forces required for deterrence or defense. Some analysts consider anything less than a 3:1 attack/defense ratio to be adequate for deterrence. Because the ratios generated by various mobilization assumptions generally do not approach the 3:1 threshold, they are not identified as particularly threatening by these analysts.

But other analysts identify ratios which favor the Pact heavily as significant indicators of Pact superiority, even though smaller forces may be required for defense than for attack. They base their view on what is known of Soviet warfighting doctrine, a doctrine which emphasizes achieving large but localized strength advantages, breaking through a defensive line, and then exploiting the breakthrough behind the lines of the defender. They also argue that there is a direct relationship between the overall Pact advantage portrayed across the entire Front by Table 5, and the capability of the Pact to achieve high, localized force ratios. Defense Secretary Schlesinger, for example, argued that a theater-wide Pact/NATO strength ratio better than 1.5:1 could lead to local breakthroughs by the Pact. 30/ This concern, echoed by

30/ Secretary of Defense James R. Schlesinger, Annual Defense Department Report, FY 1976, p. III-15.

Defense Secretary Rumsfeld, 31/ is expressed because some analyses suggest that the kind of overall ratio indicated by, say, the assumption of an 85 division attack at M+14, would permit a local Pact edge of nearly 12:1 against a single NATO corps area. 32/ Many observers, then, see the kinds of overall Pact/NATO force ratios that could be generated under certain assumptions as allowing the Pact to bring overwhelming force to bear on one or more avenues of attack, yet providing enough forces elsewhere to pin down other NATO forces there.

31/ Secretary of Defense Donald H. Rumsfeld, Annual Defense Department Report, FY 1978, p. 94.

32/ Fischer, Defending the Central Front, p. 27.

CHAPTER III. HOW TO MAKE THE BALANCE LOOK GOOD/BAD

The previous section illustrated some of the differences various assumptions can make in portraying the military balance. This section combines many of these assumptions into two separate groupings which result, on the one hand, in a pessimistic view of the balance and, on the other, a more optimistic view. Each construct is internally consistent, and while few of the many balance assessments may conform fully to one or the other of these frameworks, we believe each is fairly typical of one of the two general classes of balance assessments.

PESSIMISTIC ASSESSMENTS

Pessimistic assessments of the NATO/Pact balance tend to see the Warsaw Pact as efficient because its command structure is hierarchical and dominated by a single nation, the USSR. This view sometimes surfaces in comparisons which stress the relative unity of the Warsaw Pact, arguing that:

> Several shortcomings are common to both coalitions, but unity of command coupled with central position affords strengths to the communist side that NATO has never been able to equal. 1/

Implicit in statements like this is the view that the decision-making process in the Warsaw Pact--less subject to outside scrutiny, delay, compromise and the influence of domestic or nationalistic concerns--can make decisions on strategy faster. And once they are made, it is believed the hierarchical rigidity of the communist system allows the decisions to be carried out with speed, facility, and vigor. In this view, the Pact has an advantage over the NATO system where decisions are made by committee and are implemented through a process of negotiation, compromise, and consensus. Thus, relative unity and speed char-

---

1/ John M. Collins, "American and Soviet Military Strength, Contemporary Trends Compared, 1970-76," Congressional Record (August 5, 1977), p. S14099.

acterize the Pact's military behavior; delay and disarray are typical of NATO's behavior.

Another characteristic of pessimistic assessments is the belief that it is better to err by giving the Pact the benefit of the doubt in the absence of information than to underestimate Pact strength. A primary focus on wartime fighting rather than deterrence also tends to support such a conservative bias regarding uncertain Pact capabilities.

Pessimistic assessments tend toward symmetrical counting, but not toward symmetrical assumptions regarding the military behavior of the Pact and NATO. That is, they tend to compare totals of like things--manpower strengths, units, weapons systems--rather than evaluate how well each side can pursue its differing strategies. As a result, the categories of comparison are relatively limited; these assessments tend to exclude elements of strength on both sides which are not easily comparable. 2/ And when such unlike elements are included in pessimistic assessments, the analyst chooses those techniques for comparison which give greater weight to the relative strengths of the Pact.

Pessimistic assessments also tend to include more elements of Pact strength in their calculations of the balance than do optimistic assessments. They will often include forces from the Soviet strategic reserve and from Soviet deployments outside the Central Front area in discussions of the Central Front balance, count authorized rather than actual strengths, and sometimes include paramilitary forces--border and security troops--in Pact totals.

In contrast, pessimistic assessments normally disregard French forces in their tallies of NATO strength, or include only those based in Germany. Danish forces are usually included only in terms of the NATO/Pact balance on the Northern Front, not the Central Front. And non-NATO members of Western Europe are

---

2/ A case in point is found in the way these assessments often deal with aircraft. The commitment to symmetrical counting leads to comparisons of total aircraft numbers with little effort to differentiate on the basis of mission. Thus, Pact forces generally are portrayed as more formidable than is the case when other measures, such as bomb tonnage deliverable to various ranges, are used.

generally ignored in these assessments. More importantly, forces such as the German Territorial Army may be disregarded.

Pessimistic assessments are often tied to a short-warning scenario. This is due in part to the commitment to see the balance in terms of NATO's problems in fighting a war and a consequent fascination with those points in a scenario where the disparity in forces is greatest. It is also a function in part of the tendency to give the Pact the benefit of the doubt in areas where, one way or the other, evidence is lacking. These assessments tend to disregard command and control difficulties in moving large ground force units and to assume relatively high levels of readiness on the part of Pact forces.

It is important to note how some of the characteristics of pessimistic assessments reinforce each other. The assumption that the Pact political system facilitates military decisions and their efficient implementation, for example, supports the assumption of a short-warning attack. Efficiency, in this view, can be translated into a greater capability to carry out a well disciplined and concealed movement of large forces, a necessary condition of the short-warning attack assumption. The assumption of a short-warning attack, in turn, reinforces the assumptions that French forces would not be involved on the NATO side and that German territorial forces would not play a significant role. (The shorter the warning, the more difficult it would be to reintegrate the French back into a NATO command structure and to turn the German territorial forces into an integral part of NATO's defense.) It would also make it more difficult for NATO to adjust its forces along the Front to bolster any local areas of weakness. This, in turn, could mean that the Pact could build a local force edge of up to 12:1 in areas like the North German Plain, where NATO's forces are relatively weak. Thus, the assumption of Pact efficiency, because it supports the assumption of a short-warning attack, tends to reinforce the assumptions that French forces and German territorial forces should not be counted. In short, pessimistic analysts develop an internally consistent chain of logic, rooted in judgments on the military effectiveness of the Pact political system.

OPTIMISTIC ASSESSMENTS

Optimistic assessments judge the Pact political system very differently. They tend to view its hierarchical rigidity not as a source of military efficiency, but as inhibiting individual and lower-level initiatives, incapable of rectifying errors in

data or judgment, and because of internal secrecy and distrust, more cumbersome than the negotiation and consensus associated with NATO. Optimistic analysts do not equate Soviet domination of the Warsaw Pact with effective use of its military resources. Instead, the Soviet-Pact relationship is seen as fundamentally insecure. Soviet forces are seen not as partners in a military alliance, but in part as occupation troops, repressing nationalistic tendencies of the rest of the Pact.

One implication is a reluctance to grant the Pact the benefit of the doubt in areas of uncertainty. Where pessimistic assessments note the dangers of NATO's need for consensus and envy the military simplicity of the Pact's unified political system, optimistic ones tend to see the command problems as the same in both alliances--but dealt with less efficiently by the Pact. That difference in judgment is a major reason why the calculations of the military balance in optimistic assessments do not usually grant the Pact the benefit of the doubt in areas of uncertainty.

In contrast to pessimistic assessments, optimistic assessments typically tend toward asymmetrical counting. That is, they tend to avoid one-on-one comparisons of like entities and attempt instead to assess the capability of NATO to carry out its strategy of defense against the capability of the Pact to carry out a strategy of aggression. This tendency introduces more complexity to the comparative effort. It is in optimistic assessments that greater efforts are found to introduce the contribution of air and naval forces to the ground force balance, and comparisons move away from numbers of entities toward numerical expressions of capability. 3/

Optimistic assessments generally include forces on the NATO side of the equation which are left out by pessimistic assess-

---

3/ A prominent example is in the way air forces are handled in optimistic assessments. These avoid comparisons of total numbers and seek to express factors like the extent to which each side can disrupt the other's movement (expressed in comparative bomb tonnages dropped at different distances, etc.). Where strength comparisons of similar units with different structures are concerned, optimistic assessments almost always adopt those reduction techniques--such as WEI/WUVs--which give relatively more weight to elements in which NATO comes closest to or surpasses the numerical levels associated with Pact forces (e.g., infantry).

ments. Thus, French forces are added to NATO's totals; West German territorial forces are included, as are small, but incrementally important contributions from non-NATO West Europeans, and Danish forces are seen in terms of their contributions to the critical Central Front balance, not in terms of being limited to the flanks.

Optimistic assessments also tend to discount large drawdowns from Soviet strategic reserve forces or from the forces deployed along the flanks or the Sino-Soviet border in their calculations of the Central Front balance. They also tend to discount contributions by Polish and Czech forces. Some assessments degrade the level of Soviet forces in these countries on the grounds that some of them would be oriented toward rear security. Nearly all optimistic assessments disregard potential contributions made by Pact paramilitary forces--border and security troops--in their calculations.

Optimistic analysts tend to discount surprise or short-warning Pact attacks. If the Pact launched an attack without warning, they believe, the strength of the attack would necessarily be limited. The Pact could not build to a clearly predominant level of force, in this view, in a short time, and the effort could not be done without alerting NATO. This tradeoff is premised on a series of assumptions which stress the command and control difficulties associated with moving Pact forces and preparing them for an attack. Optimistic analysts do not question the physical capacity of the road and rail networks to accommodate the movements required. They do discount the human capabilities to manage the movement and establish the necessary command and control structures.

As in the case of pessimistic assessments, optimistic ones have their internal logic and consistency. The view that the Pact is limited by distrust and repression, for example, supports arguments against including non-Soviet Pact forces in strength tallies, justifies not counting border or security troops as part of an attacking force, and suggests that even some regular Soviet forces might be charged with rear security missions in the event of conflict. Given the kind of conservative biases these assessments associate with Soviet decisionmakers, the probability that the Soviets would risk redeployments from the flanks logically declines. Thus, judgments regarding the Pact's political system support the view that it would take the Pact relatively long to assemble and prepare a large attack. And given the deduction that a Pact build-up would be obvious and long, it becomes logically more consistent to assume a reintegration of French forces to

the NATO command structure and to count them on the NATO side of the balance. It also makes it logical to assume that NATO would have more opportunity to adjust its forces along the Front to correct any weaknesses in its current posture.

SOME TYPICAL EXAMPLES

The following tables present the kinds of data which are typically associated with what we have called pessimistic and optimistic assessments. They also provide brief summaries of the rationale for the data presented. The data portrayed are taken or derived from actual assessments. Comparisons between the data sets should, however, be made with caution, since few, if any, of the assessments from which the data were drawn were published simultaneously. It is best, therefore, to view the data presented by the tables strictly as illustrations of the kinds of things which the two general categories of assessments are concerned with and how they go about portraying these elements. The tables are in effect a summary of the previous discussion which relates that discussion to specific examples.

TABLE 6. ILLUSTRATIVE UNDERLYING ASSUMPTIONS IN NATO/WARSAW PACT BALANCE ASSESSMENTS

Pessimistic	Optimistic
Major aim is to defeat Pact forces in event of war. Valid therefore to hedge against not having enough military resources.	Major problem is to deter Pact attack. Implies level of capacity that may not be as high as necessary to defeat Pact forces.
Authoritarian/hierarchical system allows Pact nations to carry out military plans effectively and quickly.	Pact concern with control and secrecy degrades efficiency. Inhibits lower unit initiatives. Leads to internal distrust.
Better to err on the side of overestimates of Pact military strength.	Not advisable to give Pact forces benefit of the doubt in absence of data. Pact forces likely to have at least as much difficulty in command and control as NATO's.

TABLE 7. ILLUSTRATIVE NATO/WARSAW PACT BALANCE COMPARISONS: CENTRAL FRONT GROUND FORCES a/

PESSIMISTIC VIEWS

Rationale

Includes active U.S./NATO divisions only; Soviet Category III divisions at full strength on assumption that these could be filled rapidly; excludes German territorial and French forces on assumption that these forces would not be involved directly in conflict with Pact.

Military Personnel	
NATO	Pact
1.045 million	1.216 million

Tanks viewed as a valid measure because of Soviet doctrine; data include prepositioned stocks for 2 U.S. divisions; estimated stocks in storage for USSR.

Tanks	
NATO	Pact
6,615	16,000

Includes all active divisions in NATO center region less French, which are not under NATO control; Category I divisions in East Germany, Czechoslovakia, and Poland; excludes separate brigades and regiments.

Divisions	
NATO	Pact
24	51

Assumes rapid reinforcement of Central Front by Soviet forces elsewhere; delayed entrance of French forces. Does not count West German territorial forces.

Size of Pact Threat After 30 Days Mobilization	Pact/NATO Force Ratio at: b/ M-Day	M+14	M+30
85 Divisions	1.5	2.1	1.6
128 Divisions	1.5	2.4	2.4

(Continued)

a/ Sources: Derived from John Collins, "American and Soviet Military Strength, Contemporary Trends Compared, 1970-1976," Congressional Record (August 5, 1977), p. S14098-99 (table 25); International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977); Robert Lucas Fischer, Defending the Central Front: The Balance of Forces (London: International Institute for Strategic Studies, Adelphi Paper No. 127, Autumn 1976).

TABLE 7. (Continued)

OPTIMISTIC VIEWS

Military Personnel		Rationale
NATO	Pact	
1.096 million	1.124 million	Includes active duty German territorial forces and forward deployed French and Danish forces on assumption they would be involved; includes Category II and III divisions at less than authorized strength.

Numbers of tanks not included because one-on-one comparisons considered misleading.

Divisions		
NATO	Pact	
32	51	Includes separate brigades and regiments aggregated as division equivalents; includes 5 French divisions on assumption that French would be involved in event of conflict.

Size of Pact Threat After 30 Days Mobilization	Pact/NATO Force Ratio at: b/			
	M-Day	M+14	M+30	
85 Divisions	1.4	1.6	1.4	Assumes delays in Soviet reinforcements; early entrance by French forces; counts West German territorial forces.

b/ Expressed in strengths of combat units; assumes NATO mobilization lags behind Pact's by one week.

TABLE 8. ILLUSTRATIVE NATO/WARSAW PACT BALANCE COMPARISONS: CENTRAL FRONT AIR FORCES a/

PESSIMISTIC VIEWS

Rationale

	Combat Aircraft	
	NATO	Pact
Data refer to aircraft in Central Europe on argument that this is best comparative basis; excludes French, U.S. carrier-based and U.S. dual-based aircraft.	1,810	2,500

Generally does not seek additional comparative measures.

(Continued)

a/ SOURCES: Derived from John Collins, "American and Soviet Military Strength, Contemporary Trends Compared, 1970-76," Congressional Record (August 5, 1977), p. S14098 (table 25); International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977); Jeffrey Record, Sizing Up the Soviet Army (Washington, D.C.: The Brookings Institution, 1975), pp. 50-51; Peter Borgart, "The Air Attack Potential of the Warsaw Pact," International Defense Review (2nd Quarter, 1976), pp. 193-197.

TABLE 8. (Continued)

OPTIMISTIC VIEWS		
		Rationale
Combat Aircraft		
NATO	Pact	
3,462	3,680	Data refer to resources that can supplement aircraft already in place. Includes U.S. dual-based and French aircraft and naval air from two carrier wings, plus some rapid deploying reserves.
NATO/Pact Ratio of Bomb Tonnage Drop Capability at Equidistances b/		Accounts for variation in aircraft capabilities and missions and allows easier integration to ground force balance.
100 nm.	200 nm.	
3:1	7:1	

b/ Portrays single sortie comparison of entire air fleet of both sides.

CHAPTER IV. HISTORY OF NATO/WARSAW PACT BALANCE ASSESSMENTS

Official U.S. perceptions of the NATO and Warsaw Pact conventional force balance have gone through three major phases. Outright pessimism regarding NATO's conventional capabilities--in the form of perceived Soviet conventional superiority--dominated U.S. and European views in the 1940s and 1950s. In the 1960s, however, the official U.S. view shifted toward optimism as the balance between NATO and Warsaw Pact forces was seen to have become about even. In the last few years, commentary on the balance has resumed a more pessimistic tone.

Actual changes in the opposing forces have prompted most of this evolution. But the shifting official view of the balance can also be linked to changes in the concerns of policymakers and to changes in analytical perspective.

THE ERA OF PERCEIVED SOVIET CONVENTIONAL SUPERIORITY

From the close of World War II to the early 1960s, Western analysts agreed that the Soviet Union had overwhelming superiority in conventional forces in Europe. Soviet ground forces throughout this era were estimated to number 2.5 million men with 175 or more well-equipped divisions. 1/ Western forces, at the outset a handful of units doing occupation duty in Germany, grew over the period to between 16 and 20 divisions--each larger than its Soviet counterpart--in the Central Region. 2/ Despite this improvement, nuclear weapons were seen as the principal Western response to the Soviet army during this era.

This policy was challenged briefly in the United States following the victory of Communist forces in China and the ex-

---

1/ Published Western appraisals varied in details. For a summary view of these appraisals in the 1950s and 1960s, see Thomas W. Wolfe, Soviet Power and Europe (1945-1970) (Baltimore: Johns Hopkins Press, 1970), p. 166.

2/ William W. Kaufmann, The McNamara Strategy (New York: Harper and Row, 1964), p. 110.

plosion of the first Soviet atomic device in 1949. These events led to one of the most famous policy reviews of the last 30 years. Known as NSC-68, it predicted a long, intense competition between the Soviet Union and the United States in military, political, and economic fields. In the military realm, it forecast the creation of Soviet nuclear forces as a deterrent to U.S. power, and argued that failure to build strong conventional forces would leave an exploitable gap in Western defenses. 3/

For the next three years, coinciding with the Korean War, the United States not only spent more for conventional forces, but also for an accelerated buildup of strategic forces to deter Soviet nuclear attacks. Additional U.S. divisions were deployed to Europe, and the NATO integrated command structure was created. However, in the early 1950s, efforts to reach a conventional balance with the Soviets in Europe seemed to be beyond the economic reach of NATO. 4/

Thus, beginning in 1954, the United States returned to an emphasis on nuclear deterrence and retaliation, a policy to

---

3/ The text of NSC-68 can be found in U.S. Department of State, Foreign Relations of the United States, 1950, Vol. 1 (Washington, D.C.: 1977), pp. 234-293. For commentary see Samuel P. Huntington, The Common Defense: Strategic Programs in National Policies (New York: Columbia University Press, 1961), p. 50, and Kaufmann, The McNamara Strategy, pp. 18-21.

4/ In 1952, NATO planners tentatively approved a requirement for 96 NATO divisions to meet the 175-division Soviet threat. The perceived requirement seems to have had the effect of discouraging Western governments from attempting to achieve a conventional option. The cost of equipping these divisions and associated air forces would have been $40 to $50 billion at 1952 prices, or about 10 percent of NATO's combined GNP, on top of what was already being spent by the United States for strategic forces, naval forces, and the Korean War. See Alain Enthoven and K. Wayne Smith, How Much is Enough? (New York: Harper and Row, 1971), pp. 118-120.

be supplemented by the tactical use of nuclear weapons in Europe. 5/ By 1957, NATO's force goals for the Central Region had been scaled down to 30 nuclear-armed divisions; actual forces reached less than two-thirds of this goal. 6/

Toward the end of the 1950s, the launch of Sputnik and the rapid growth in Soviet nuclear forces for the European theater both signaled the need to reconsider this doctrine. By the end of the decade, a number of analysts held the view that nuclear deterrence had become a two-way street. Reviving the position taken in NSC-68, they argued that with weak conventional forces, NATO in a crisis would be faced with a choice between nuclear suicide or conventional defeat. But the major hurdle to achieving an adequate conventional defense capability remained the perception of Soviet conventional dominance in Europe.

THE GROWTH OF THE PERCEPTION OF ROUGH PARITY

In the next half-dozen years, the official U.S. view of the balance changed dramatically. By the mid-1960s it appeared to Defense Secretary Robert S. McNamara and his staff that NATO and the Warsaw Pact had approximate equality on the ground in Central Europe as well as approximately equal abilities to reinforce. 7/

This new perception had two sources. The first was a major increase in NATO's general purpose forces capabilities. Following

---

5/ On coming into office in 1953, President Eisenhower declared that an effort to match the Soviet threat by conventional means would force upon the United States "an unbearable security burden leading to economic disaster." He promised to take a "New Look" at U.S. and NATO military requirements. The policy that emerged placed primary reliance on the threat of retaliation with nuclear weapons "and less dependence on local defensive power," in an effort to minimize the costs of defense. See Huntington, The Common Defense, p. 66; Enthoven and Smith, How Much Is Enough?, p. 120.

6/ Enthoven and Smith, How Much Is Enough?, p. 121.

7/ Ibid., p. 142.

the Berlin crisis of 1961, U.S. general purpose forces were strengthened in a variety of ways. (Procurement for the general purpose forces between 1962 and 1969, for example, was 40 percent higher than it had been from 1954 to 1961, even excluding funds for Southeast Asia operations. Procurement for mobility forces doubled. 8/) The allies also provided additional forces. Thus, by 1965 NATO could count more than 29 divisions available in the Central Region on M-Day--an improvement of as much as 80 percent since 1960. 9/

The second source of the change in perception was major revisions in estimates of Soviet military capability. These reflected both actual changes in Soviet forces and a closer look at the conventional wisdom on the size, strength, and readiness of the Soviet army. Beginning in the late 1950s, the Soviet Union undertook a large reduction in military manpower. 10/ Meanwhile, the Kennedy Administration, in an effort to define with more precision the requirements for a conventional option in Europe, began a reassessment of the threat to NATO. When the review was completed, the estimated size of the Soviet army had been scaled back from 2.5 million men and 175 well-equipped, ready divisions to about 2 million men and between 140 and 150 divisions of lesser individual capability than NATO's larger divisions, and maintained at varying levels of readiness. Thus, instead of crediting the Warsaw Pact with a capability of assembling over 125 divisions against NATO in a matter of weeks, the new assessments held that the Pact was unlikely to deploy more

---

8/ Computed from historical budget data supplied by the Assistant Secretary of Defense (Comptroller), Office of the Secretary of Defense, "Total Obligational Authority By Appropriations Account and Defense Program, Fiscal Years 1945-1978," computer print.

9/ House Committee on Appropriations, Department of Defense Appropriations for 1967, Hearings, Part 1, 89-2 (1966), p. 140.

10/ Wolfe, Soviet Power and Europe, p. 144.

than 80 to 90 divisions in the Central Region over a period of several months. 11/

By 1967, the NATO allies were persuaded of the feasibility of at least an initial defense of NATO with conventional forces. Formal NATO doctrine was altered to reflect this capability, under the label of "flexible response."

But the withdrawal of France from the NATO command structure and the Soviet invasion of Czechoslovakia combined to darken the tone of assessments after 1968.

THE SWING BACK TOWARD PESSIMISM

The 1970s have seen the emergence of a new concern with NATO's conventional defense capabilities in Central Europe. This concern has focused on two issues: uncertainty about NATO's capability to defend against a surprise attack, and uncertainty about the speed, size, and capabilities of Soviet reinforcements.

Although the surprise attack problem surfaced as early as 1965, 12/ concern with it increased after 1968, when the Soviet Union moved five divisions from its territory to Czechoslovakia, and still more in the mid-1970s, following evidence of gains in the firepower, mobility, and air support of Soviet forces in Europe.

Concern with the mobilization and reinforcement capabilities of the Warsaw Pact surfaced in a series of assessments performed

---

11/ Enthoven and Smith, How Much Is Enough?, pp. 132-147, 157; Kaufmann, The McNamara Strategy, p. 83 ff; Timothy W. Stanley, NATO in Transition (New York: Praeger, 1965), pp. 23, 273.

12/ Stanley, NATO in Transition, pp. 270-271. The author argued that even with approximately equal forces on each side, a Pact attack could achieve "at least five-to-one superiority at the point selected for a breakthrough and, by exploiting it, compel the NATO forces to withdraw toward the Rhine." He attributed NATO's weakness in part to the ability of the attacker to concentrate his forces and in part to a maldeployment of NATO forces.

in the early years of the Nixon Administration. Although some of these reinforced the assessments of the 1960s that a conventional defense of NATO was feasible for as long as three months or more, others found NATO unlikely to hold against a determined Pact attack for more than about two weeks. 13/

Thus, within the last several years, the official view of the balance seems to have shifted towards the pessimistic end of the scale. Defense Secretary Rumsfeld's statement on the fiscal year 1978 defense budget, for example, said that:

> At present, the United States and its allies in NATO have sufficient active forces to maintain an acceptable ratio of defense-to-offense against either type of attack. However, it would be a mistake to conclude that, because of an acceptable ratio, we have high confidence of conducting a successful forward defense in all instances.... Contrary to conventional wisdom, NATO may have enough manpower to stem both the short-warning and the full-scale attack, but without prompt remedial action, the alliance may lack the necessary firepower and mobility to do its job.... 14/

The view that the balance may be shifting toward the Warsaw Pact but is not yet hopeless also seems to be the view of the Carter Administration. Reporting on the results of the most recent milestone in balance assessments, Presidential Review

---

13/ The studies included a series initiated by National Security Study Memorandum (NSSM) 3, which led to the "1-1/2 war" planning guidance first issued in 1969; NSSM 84, U.S. forces and strategies for NATO, which looked at U.S. force requirements in Europe; and a series of studies initiated by NSSM 95, Mutual and Balanced Force Reductions, which looked at military balance issues in the context of East-West negotiations on force reductions. The internal Defense Department debate over the balance surfaced in 1973 when a newspaper account of the studies highlighted an optimistic view. See Michael Getler, "Study Insists NATO Can Defend Itself," Washington Post, June 7, 1973.

14/ Secretary of Defense Donald H. Rumsfeld, Annual Defense Department Report, FY 1978, p. 109.

Memorandum (PRM) 10, Defense Secretary Brown declared that force improvements continue to be needed in NATO's initial combat capabilities and rapid reinforcing capabilities. 15/

THE RELATIONSHIP OF BALANCE ASSESSMENTS TO DEFENSE STRATEGIES AND BUDGETS

This history of views of the balance shows some of the relationship between doctrine and analysis. One outgrowth of the doctrinal shift away from massive nuclear retaliation, for example, was a major change in the kinds of questions which were asked about the balance in Europe. In the 1950s, the particulars regarding strength, readiness, deployment schedules, and other capabilities of the 175 Soviet divisions were of relatively small importance to policymakers. But once exclusive reliance on nuclear weapons was no longer considered tenable, there was a strong incentive to discover an approach to conventional defense which had feasible costs. Thus, the central question regarding the balance in the 1960s was the level of resources needed to match Pact capabilities for conventional warfare in Europe. The answer to this question depended on a careful definition of those capabilities. Once the problem of providing NATO with a viable conventional defense was seen to be manageable without further large increases in NATO force levels or investment, the question of concern shifted. It was no longer "does NATO have large enough forces to conduct an initial conventional defense?", but "is NATO properly organized and equipped to conduct an effective conventional defense?"

Paralleling this shift in focus, analysis of the balance has tended to move from increasingly detailed comparison of inputs--men, weapons, firepower scores--to comparisons of "outcomes" derived from war games and computer simulations of combat attrition. The former are useful for describing the balance of military resources and--with the factor of time added--for examining how these resources match during a buildup. The latter facilitate analysis of the most favorable arrangements of NATO deployments, firepower, and logistics.

15/ Secretary of Defense Harold Brown, "Remarks at the Thirty-Fourth Annual Dinner of the National Security Industrial Association," (Department of Defense Press Release), September 15, 1977.

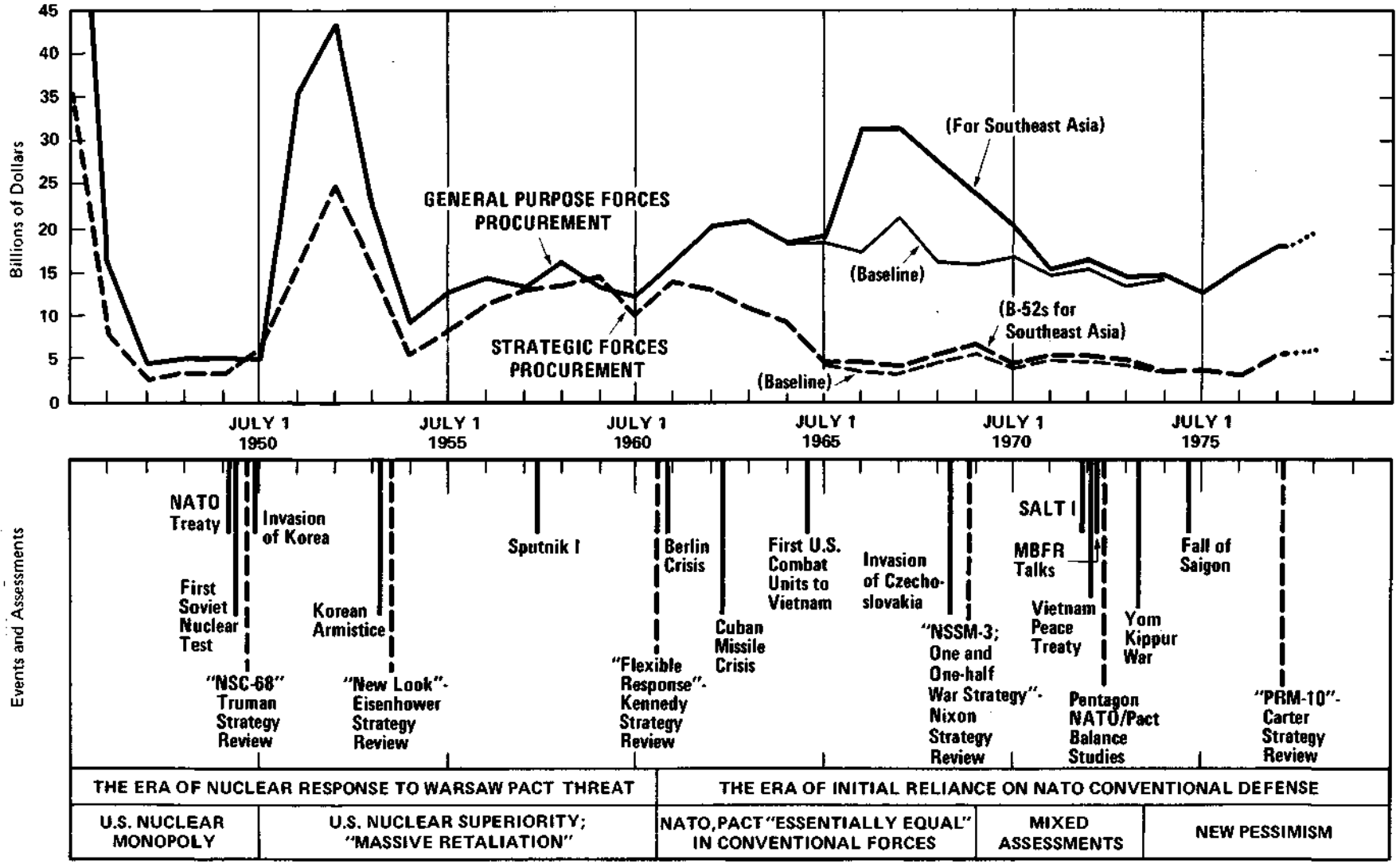
The relationship between changes in the perceived balance and the defense budget is somewhat less straightforward. Figure 3 shows the trends in procurement for general purpose forces and strategic forces over a thirty-year period. In a very general way, it can be seen that general purpose forces enjoyed both a higher level and a higher share of defense procurement beginning in the early 1960s, at a time that doctrinal shifts argued in favor of the development of a conventional option. However, spending on general purpose forces declined during the early 1970s, despite a somewhat less optimistic official view of the balance between NATO and the Warsaw Pact. 16/ The decline may be attributable to various influences, including force reductions undertaken in connection with the end of the Vietnam War and the adoption of the "1-1/2 war" strategy, a general atmosphere of detente in Europe, negotiations with the Warsaw Pact regarding possible force reductions in Europe, a growing concern in the Congress with other priorities, and the lingering influence of optimistic balance assessments. But the operative causes cannot be identified with certainty. Beginning in 1976, however, general purpose funding has risen, and increases may be attributable in part to the darkening tone of official assessments, which became more pronounced beginning in 1974.

16/ Overall, general purpose forces procurement funding between 1970 and 1977 was 20 percent below the level for 1962-1969, excluding the Southeast Asia increment.

Figure 3.

TOTAL OBLIGATIONAL AUTHORITY FOR SELECTED PROCUREMENT, AND CURRENT EVENTS AND U.S. ASSESSMENTS OF THE BALANCE:

FISCAL YEARS 1945 THROUGH 1978, IN CONSTANT 1978 DOLLARS



CHAPTER V. CONCLUSIONS

A legitimate assessment is one that is internally consistent, open regarding the data used, and honest in the way it makes its calculations. And in terms of these criteria, there are legitimate pessimistic and legitimate optimistic assessments of the NATO/Warsaw Pact balance. 1/ Comparing these assessments, and viewing them with some historical perspective, however, suggests the following.

Optimistic assessments are optimistic only in comparison with pessimistic ones. Few if any of the numbers or ratios used in them demonstrate a clear NATO superiority vis-a-vis the Warsaw Pact. They do, however, portray a closer balance between the two sides and, in this, imply that Pact aggression would have much less chance of success than is implied by pessimistic assessments.

Both optimistic and pessimistic assessments point to the importance of what U.S. allies in NATO do or do not do. They agree that major variables in the balance are what the USSR does on the Pact side and what U.S. allies do on the NATO side. They differ primarily in how they portray these variables.

Balance assessments are likely to continue to be presented as a major rationale for either increasing or decreasing the defense budget. To date, most of the assessments presented to the Congress have been devoted to comparisons of things--people, weapons, or units--in what is known as "static bean counts." These help simplify the great complexity in the full, actual military relationship between NATO and the Warsaw Pact and, if provided for various points in time, can give a sense of the way in which that relationship is changing. But judgments based on "bean counts" about how an actual conflict would turn out are extremely tenuous.

1/ Within reasonable bounds regarding data, of course. There are assessments--both pessimistic and optimistic--that are internally consistent but are simply based on spurious data. This paper, however, deals with the problem of why assessments that work from the same general pool of data end up so differently.

Dynamic assessments--war games or other simulated conflict--probably provide more insight to the balance because they concentrate on change and process. But they, too, are extremely limited as predictors. Indeed, with the kind of balance assessments that have been most prominent--whether static comparisons of weapons or dynamic simulations of combat--actual historical battles would be hard to explain. By their criteria, France and Britain should have defeated Germany handily in 1940.

Some technical conclusions can also be made. In general, the more assessments move away from gross numbers of units or weapons systems and try to portray interactions, constraints, and capabilities, the more optimistic they become. This is particularly the case in comparisons of air forces.

This suggests that, to the extent balance assessments attempt to integrate the impact of air forces into the ground force balance, they become less pessimistic. Such an integration implies going beyond simple counts to some sort of calculus that converts aircraft capabilities into something comparable to ground force output (casualties, destructiveness, and so on). At present, there is no agreed upon method for doing this. But work to this end continues and, to the extent such analytic techniques are developed, the perceived balance is likely to become more optimistic.

Balance assessments are being increasingly criticized by their craftsmen on the basis that, historically, superior resources have not always been the determinants of success on the battlefield. The future of balance assessments, therefore, probably lies in the evaluation of command and control systems and behaviors, the impact of different organizational concepts, military doctrine, and decisionmaking on both sides of the balance. These are the areas in which the genesis of optimism or pessimism in past assessments often lies, but are the areas in which relatively little work has yet emerged. In the future, however, the Congress is likely to hear less about "bean counts" and more about comparisons in these areas.

APPENDIX

"BEAN COUNTING"

Nearly all assessments of military balances compare numerical factors on one side with those on another. Even assessments which assume that nonquantifiable factors are really what count in military relationships (e.g., will, leadership, loyalty, etc.) generally begin with tallies of what is easier to count. These tallies may be adjusted or discounted by applying some formula that introduces less quantifiable elements, but any such construct still requires a count of people and things.

There are two general approaches to counting which run through the various assessments. The first, and most prevalent, bases its conclusions on tallies of the same or very similar entities on both sides of the balance. The second approach counts different things on each side. For purposes of discussion, the two approaches can be characterized as symmetrical and asymmetrical counting.

Symmetrical Counting

Symmetrical counting is a comparative exercise in which the same genre of entities is addressed. The approach recognizes that there may be differences among and between the things that are tallied on each side, but assumes that meaningful comparisons can be made so long as what is counted can reasonably be related to combat strength, are essentially the same things, and are counted accurately.

These criteria can, however, pose analytic difficulties in practice. For while there are weapons systems on both sides of the NATO/Warsaw Pact balance which are clearly comparable in terms of either physical characteristics or combat role, there are other items on each side which possess significant combat potency, but

for which there is no clear counterpart on the other side. 1/ The analytic problem is complicated by these kinds of important but singular entities, and counts which stress symmetry in their tallies must often either stretch the categories of comparison to account for dissimilarities in major items of equipment or exclude such items from the comparisons. In short, the prices of symmetrical counting are often a lack of comprehensiveness or a diffusion brought about by very broad categories of comparison.

The accuracy of symmetrical counting is inhibited by the efforts of both sides to conceal major components of military strength. The greatest efforts at deception may be associated with those items that bean counts are most interested in.

Even with these inherent difficulties, symmetrical counting profoundly influences perceptions of military balances. Counts of the same things on both sides of a military equation provide the quickest, apparently least complicated overview of the actual balance. For these reasons, symmetrical counts are prominent in public discussions. They appeal to people who seek to mobilize support for or against decisions. They lend themselves to dramatic presentation and can be politically potent.

Asymmetrical Counting

While symmetrical counting concentrates on the same or similar things, the asymmetrical approach begins on the assumption that each side of a military equation is best measured against its objective. As one discussion of the balance in Central Europe expressed it:

> The object is not to measure NATO military capability in a symmetrical sense but, rather differently, to measure NATO's ability to defend against the Pact's ability to attack. 2/

1/ An example on the Pact side is the Soviet armored personnel carrier called the BMP. Both physical characteristics and tactical role distinguish this vehicle from armored personnel carriers in most of the NATO inventories. Likewise, the U.S. aircraft carrier has no real counterpart in the Pact inventories.

2/ Robert Lucas Fischer, Defending the Central Front: The Balance of Forces (London: International Institute for Strategic Studies, Adelphi Paper No. 127, Autumn 1976), p. 6.

Many of the same data that form the heart of symmetrical counting exercises are also important to the asymmetrical approach. But the arrangement of these data may be very different. For while a symmetrical approach expresses a balance by tallying, say, the tanks on each side, an asymmetrical approach would be more interested in comparing tanks on one side to antitank weapons on the other. This avoids the tendency to stretch categories of comparison in order to fit unlike systems into a bean count.

But asymmetrical counting introduces a new order of complexity and the risk of double-counting. Many major items of equipment, for example, possess the capability of countering more than one component of military power on the other side. This poses problems of presentation. No matter how realistic it may be to count, say, fighter-attack aircraft against different targets, presenting such data simply looks very much like double-counting. While asymmetrical counting provides what many believe to be analytic rigor, the price paid in presentation may be great.

COMPENSATING FOR DIFFERENCES

Nearly all assessments share the assumption that, at base, the military balance is a function of people (manpower), technology (weaponry), and organization. The first two elements in this relationship are most susceptible to counting; the organizational aspects are more difficult; and the interrelationships between manpower, weaponry, and organization are the most difficult to capture in the assessment. Most assessments, then, include counts of people and weapons, but differ in how they handle the manner in which manpower and technology is merged and organized.

A basic analytical difficulty in comparing ground forces is the need to reflect adequately the large differences in organization between NATO, with a small number of large divisions and large support forces, and the Pact, with a large number of small divisions and relatively small support forces.

Firepower as a Common Denominator

The most prominent methods of comparing unlike forces have focused on firepower capabilities.

A crude way of doing this is to simply add the numbers of major items of equipment in opposing units, establish a ratio on the basis of these sums, and then rank the units accordingly. By

this kind of measure, for example, an American mechanized division is about 10 percent "superior" to a Soviet mechanized rifle division and a U.S. armored division is roughly 35 percent superior to a Soviet armored division. 3/ Running divisional units on both sides through this kind of a calculation and doing the same thing with aggregates of independent, smaller units (e.g., creating divisonal equivalents--three separate brigades equal one division, etc.) provides one means of dealing analytically with variations in size and structure on both sides of the balance.

A more sophisticated approach, however, is to try to account for all the firepower capability in different units, in effect comparing unlike systems to each other. Most analyses use one of two general types: "judgmental" firepower scores, associated with the terms Weapons Effectiveness Indices and Weapon Unit Value (WEI/WUV); and "laboratory" scores, associated with the term firepower potential.

Judgmental Firepower Scores. Judgmental firepower scores are produced by experienced military officers who estimate the relative effectiveness in combat of various weapons in the course of systematic discussions. These dialogues result in conclusions that, say, a mortar has 40 times the casualty-producing capability of a rifle or that, in a tank-to-tank engagement, a U.S. tank is about 1.2 times more effective than a Soviet tank. Where possible, these judgments are tested against historical data and refined through a delphi technique (a systematic process of narrowing differences between participants). This process produces a series of index numbers which, in effect, can reduce any given weapon to an "equivalent" of rifles, tanks, etc. These numbers, referred to as Weapons Effectiveness Indices (WEIs), provide the common denominators for comparing units. Any given unit can then be assigned a number, referred to as a Weighted Unit Value (WUV), by counting the various weapons it has, multiplying each type by a WEI, and adding the results. This process is the basis for the balance assessments provided in many of the Executive Branch's national security study memoranda over the last decade and the recent PRM-10.

3/ Ibid., pp. 12-13. By adding numbers of medium tanks, long-range antitank guided weapons, and medium and heavy artillery, the author indicates a 444:399 ratio in favor of the U.S. mechanized division and a 534:399 ratio in favor of the U.S. armored division.

Laboratory Firepower Scores. Less explicitly judgmental, firepower scores draw primarily upon data produced from ballistics research on the fragmentation characteristics of various munitions. They eschew military judgment in determining the relative worth of weapons in various technical situations. Instead, the central feature of laboratory firepower indices is the relative lethal area of the fragments against different types of targets. Thus, for a given munition, the lethal area times the quantity fired, as adjusted for the type of target, can provide a score for the weapon using that munition. Similar scores could be generated for armor-defeating devices, with tank conditional kill probabilities being the counterpart of the lethal areas.

These scores provide an alternative basis for aggregating diverse weapons and for comparing different units. The procedure is essentially the same as when judgmental firepower scores are applied: each type of weapon in each unit is reduced to an index number which expresses either lethal area or tank kill probability; this index is multiplied by the number of weapons of each type; and the sums of the products (referred to as an Index of Combat Effectiveness, or ICE) express the firepower of each unit in terms that can be compared regardless of differences in unit structure.

Despite intense effort over the last decade, however, no fully accepted method exists for reducing disparate fighting elements on both sides of a military equation to a common comparative level. All attempts to do this involve assigning relative weights to the diverse combat specialties and weapons systems. And the two most prominent approaches to the problem--judgmental and laboratory firepower scores--are limited in their ability to evaluate differing units and weapons or suspect in the manner in which they attempt to do it. Judgmental firepower scores ideally represent actual combat experience filtered through the perceptions of military men. But this necessarily introduces great subjectivity to the weighting process. Laboratory firepower scores have been criticized as arbitrary and divorced from actual experience. 4/ And other studies have argued that a

---

4/ See, for example, Alain C. Enthoven and K. Wayne Smith, How Much is Enough? (New York: Harper and Row, 1971), p. 136.

great deal of subjective judgment also enters the derivation of firepower scores from laboratory data. 5/

Quality

The incorporation of considerations of quality in balance assessments can be deceptively simple, particularly in those assessments that use index numbers to reduce different forces to a common comparative basis. Once this has been done, for example, it is a simple mathematical task to multiply the index number by another numerical factor which adjusts for variations in quality of the force. The derivation of the quality factor is, however, quite debatable. There have been at least two ways in which it has been attempted, neither of which is fully satisfactory.

One means of adjusting for quality is to seek some objective standard against which the judgment of quality can be applied. A prominent example is in the designation of different readiness categories for Soviet divisions, categories that are based on the levels of manning and equipment maintained by the various divisions in the Soviet force structure. Here, judgments as to the relative quality of a division are consciously tied to objective

---

5/ J. A. Stockfisch, Models, Data and War: A Critique of the Study of Conventional Forces (The Rand Corporation, R-1526-PR, March 1975), pp. 31-33. Stockfisch shows that the concept of lethal area, on which many firepower potential scores rest, is a function of fragment density, distribution, mass, and velocity. Those elements are measurable and subject to laboratory investigation. But he also shows that lethal area is also a function of a projectile's burst height, angle of fall, terminal velocity, and of the target's vulnerability. These are generated by tactical considerations and, thus, "any given lethal area number is . . . an average of some, or even all of these variables, or assumptions about these averages. Thus, the area lethality is not as straightforward, measurable and testable as the techniques imply." And "although fragment behavior in terms of density of mass/velocity combinations can be measured objectively, the 'lethality' of these data is not easily determined. . . . The human incapacitation criteria are the results of a subjective evaluation process on the part of medical men. . ." based on judgments of how observed wound tracks in several goats would produce pathological effects on human beings.

evidence. Another means is behavioral or historical. An example is the Arab-Israeli military balance, where the "balance," as portrayed by manpower, unit comparisons, or firepower scores has nearly always favored the Arabs yet has not reflected the outcome of the last three confrontations between the two sides. Analysis reveals that the ratio in favor of Arab manpower or firepower potential has been remarkably stable, hovering around about 4:1 in the Arab favor prior to each Arab-Israeli war over the last two decades. The fact that the Israelis did not "lose" in any of these confrontations has led some analysts to suggest that while manpower or firepower favor the Arabs, discipline, leadership, and training have favored the Israelis. They argue that the Israeli edge in these areas can be reflected in balance assessments by multiplying the Israeli side of the equation by some number which reflects the Israeli ability to compensate for relative deficiencies in manpower and firepower vis-a-vis the Arabs.

Unfortunately for analysts--but fortunately for the world--there has been no historical pattern of NATO/Warsaw Pact confrontations which could generate a similar quality factor applicable to the balance in Europe. Explicit efforts to adjust the balance to reflect quality considerations have therefore been restricted primarily to those of the first approach.

Implicitly, however, considerations of relative quality enter balance assessments in several ways. One is via the manner in which firepower scores are generated, particularly those which have previously been described as judgmental firepower scores. Here, subjective evaluation of the quality of different weapons systems in combat enters the derivation of the firepower score directly. And even in the laboratory-derived firepower scores there is leeway for subjective evaluation of the quality both of weapons and of the manner in which they are used to enter the equation. The difficulty is not so much that firepower scores carry implicit considerations of non-quantifiable elements, but that these considerations are seldom made explicit and clear.

Strategy

Variations of strategy are usually dealt with in balance assessments by adjusting the numerical comparisons according to whether one side or another is attacking or defending. One common method is to apply certain "threshold" force ratios (based on firepower scores, manpower, or other comparisons) below which an attack is likely to be unsuccessful. These ratios are based on traditional military rules of thumb for which historical

evidence is inconclusive. 6/ Typical threshold attacker/defender ratios used in many current assessments include:

- o A "breakthrough" ratio (5:1)
- o An "offensive" ratio (3:1)
- o A "prepared defense" ratio (1.7:1--one defender for every 1.7 attackers)
- o A "hasty defense" ratio (1.4:1)

It is important to recognize that these ratios--which clearly favor the defense--are meant to apply to localized situations, not across a theater front (as in Central Europe) or even at the army group or corps level. Thus, it is possible for an attacker to achieve a breakthrough against a numerically superior opponent (as German forces did in 1940 and 1941) by concentrating his forces and employing surprise and speed--provided the defense fails to react appropriately. On the other hand, a defender may be able to frustrate a numerically superior attack even when the initial force ratios are highly unfavorable, if the defender can more reinforcements to the sector more rapidly than the attacker can increase his effort. Many analysts argue that outcomes depend as critically on such factors as how forces are distributed, intelligence, mobility, and the preparation of defensive lines as they do on theater-wide force ratios.

Adjustments for strategy or tactical mode can also enter assessments of the balance at other points. Some firepower scores, for example, include consideration of different tactical modes, as suggested by the following table, which illustrates the way in which these judgments can enter analysis.

As the table shows, both the mechanized and armored divisions are viewed as relatively more effective in an offensive mode than in a defensive mode. In contrast, the effectiveness implied for artillery units is higher in the defensive mode than it is

---

6/ Jack N. Merritt and Pierre M. Sprey, "Negative Marginal Returns in Weapons Acquisition," in Richard G. Head and Edwin J. Rodke, eds., American Defense Policy, 3rd edition (Baltimore: Johns Hopkins Press, 1973), p. 487.

TABLE A-1. FIREPOWER INDEX FOR VARIOUS UNITS a/
(91-100 PERCENT STRENGTH)

Type of Unit	Offense	Defense
Mechanized Division	25	20
Armored Division	30	15
Armored Cavalry Regiment	3	6
Artillery Group	3	4

a/ Department of the Army, U.S. Army Field Manual FM-100-3; Maneuver Control (Washington, D.C.: 1968), p. D-29 (Table D-6).

in an offensive context. These are, of course, judgments. There is a logical rationale for them—assigning a higher potency to artillery in a defensive mode, for example, takes account of the fact that a defensive posture usually permits better knowledge about one's position and reference points and therefore allows better shooting. But once introduced to the calculations, they can generate very different balance assessments depending on the overall strategy portrayed for one side or the other.

Two general cautions regarding adjustments made for strategy are worth noting. First, the derivation of the factors used to adjust the assessment one way or another are generally unclear. Historical example runs through most of them, and it is quite debatable whether history is an accurate guide to a future conflict. Second, since adjustments for strategy can enter at several different points in an analysis, there is the danger that they may be introduced repeatedly. Thus, any assessment which claims to have dealt with the impact of strategy should be looked at carefully to assure that it has not done so too often.

STATIC AND DYNAMIC ANALYSES

So far, this discussion has concentrated on what is known as static analysis and has outlined the manner in which numerical factors are arrayed on both sides of a military equation for

any given point in time. This is the essence of static analysis--a snap shot, not a moving picture. Time can be dealt with in static analyses by constructing the numerical comparisons for several points during each side's mobilization or for different periods during a postulated confrontation. But static analyses are not constructed to portray the process of conflict, nor do they usually deal with conflict situations as opposed to the pre-conflict period or periods of mobilization.

Static analyses go beyond simple order-of-battle intelligence in several ways. For one thing, they often convert information on both sides to a common comparative basis, providing some greater depth in comparisons. For another, static analyses can be coupled with assumptions or judgments on the effect of different strategies or of qualitative elements such as leadership or discipline. In short, although any static analysis has inherent restrictions on the extent to which it can advance understanding of a military relationship, it has an appealing flexibility. And in going beyond simple order-of-battle comparisons between increasingly disparate force structures, static analyses do provide insights to the actual military balance not offered by earlier modes of comparison.

Dynamic analysis supplements and expands the vista offered by static analyses by portraying processes and by concentrating on the course of a postulated conflict as opposed to the pre-conflict period. Dynamic analysis is the generic name for a wide range of military models, simulations, and games. All these devices share the common effort to provide a moving picture of the course of a confrontation between opposing sides.

Dynamic analysis rests on data the same as, or similar to, those used in static analyses. It takes such data and "fights a war" by using computers, human players, or some combination of men and machines. In all cases, however, the structure of the model--its equations or computational routines--transforms numerical inputs into numerical assertions describing outcomes, most commonly expressed in terms of casualties on both sides or in terms of changes in the front line between two ground forces.

The war-fighting aspects of dynamic analysis make it a more complete and comprehensive mode of analysis than static analysis. It extends the analytic capability to evaluate various arrays of forces on both sides of a balance. And, if done correctly, a dynamic assessment allows detailed criticism because it provides a documented record of the criteria and judgments made in reaching conclusions on the significance of the balance between two forces.

On the other hand, dynamic analysis usually involves an additional order of assumptions and calculations. Apart from the burdens of reducing different force structures to a common base for comparisons, dynamic analysis generally requires a vast number of assumptions about what happens when two sides of a military operation actually engage in conflict with each other. Few, if any, analysts claim that they have successfully modeled all the vagaries of war. Many argue that while dynamic analysis can provide insights to the relationship between two contending military forces, confidence in any specific results of the approach should be carefully weighed against the complexity that this mode of analysis inherently entails. The analysts argue that a dynamic approach is most valuable not in trying to answer questions about which side would win in an actual confrontation, but in testing the relative impact of varying inputs to the analysis. That is, dynamic analysis is particularly well suited to assessing how differences in force availability, reinforcements, weapons, or ammunition supply affect the potential of one side to fight, not in forecasting actual outcomes in the event the two sides go to war.

U. S. GOVERNMENT PRINTING OFFICE : 1978 O - 30-908